USDA Natural Resources
Conservation Service

Ecological site R026XY054NV
WET MEADOW 14+ P.Z.

Last updated: 4/10/2024
Accessed: 05/11/2025

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.

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

The Wet Meadow 14+ P.Z. site is found on flood plains, stream terraces, and outwash terraces. The slopes are less than 4 percent and the elevations are between 4300 and 6600 feet. The soil is mucky peat, loam, and various textures. The soil is very poorly to poorly drained. The dominant plant is tufted hairgrass (Deschampsia caespitosa).

Associated sites

F026XY068NV	**Poorly Drained Stream Terrace POTR5 WSG:2W1710**
R026XY038NV	**LOAMY SLOPE 14+ P.Z.**
R026XY055NV	**DRY MEADOW**
R026XY057NV	**LOAMY BOTTOM 14+ P.Z.**

Similar sites

R026XY055NV	**DRY MEADOW** Water recedes from root zones during summer; less productive site; PONE3 dominant grass
R026XY003NV	**WET MEADOW 10-14 P.Z.** PONE3 dominant grass; lower elevations

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Deschampsia cespitosa*

Physiographic features

The Wet Meadow 14+ P.Z. site occurs on poorly drained flood plains, stream terraces, outwash terraces, and adjacent to springs and seeps. Slopes range from 0 to 15 percent, but slope gradients of 0 to 2 percent are most typical. Elevations are 4300 to over 6500 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Stream terrace (3) Outwash terrace
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Occasional
Ponding frequency	None
Elevation	4,380–6,560 ft
Slope	0–2%
Water table depth	0–30 in
Aspect	Aspect is not a significant factor

Climatic features

The climate associated with this site is subhumid with cool, dry summers and cold, wet winters. Average annual precipitation is 14+ inches. Mean annual air temperature is 40 to 45 degrees F. The average growing season is about 50 to 70 days. Climate data used to support this section were derived from PRISM and is not specifically tied to any dominant climate station.

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)	14-0 in
Frost-free period (average)	60 days
Freeze-free period (average)	
Precipitation total (average)	14 in

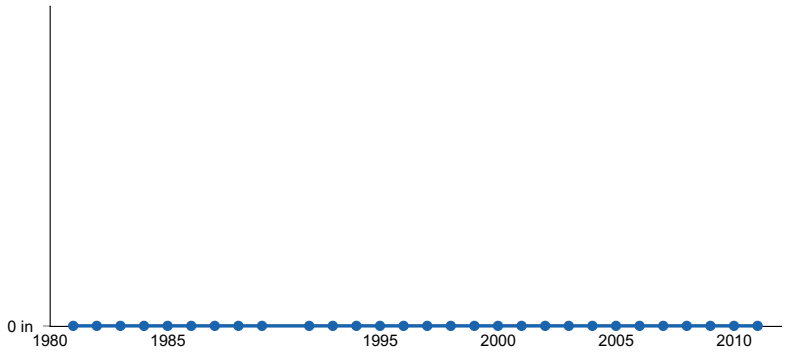


Figure 1. Annual precipitation pattern

Influencing water features

This site is influenced by seeps, springs and perennial streams.

Soil features

The soils are very deep and very poorly to poorly. Surface soils are medium to heavy textured and greater than 10 inches thick. These soils are high in organic matter and have a water table at or near the surface throughout most of the growing season. The available water capacity is very low to high. The soil series associated with this site are Eastwalker, Seeya, Endoaquolls, Floatybog, Squishy, Cumulic Cyraquolls, and Welch.

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Loam (2) Variable (3) Mucky peat (4) Loam
Family particle size	(1) Loamy
Drainage class	Very poorly drained to poorly drained
Permeability class	Moderately slow to moderately rapid
Soil depth	72–84 in
Surface fragment cover <=3"	0–7%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	4.2–6.9 in
Calcium carbonate equivalent (0-40in)	0–1%
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	6.1–7.3
Subsurface fragment volume <=3" (Depth not specified)	0–48%
Subsurface fragment volume >3" (Depth not specified)	0–5%

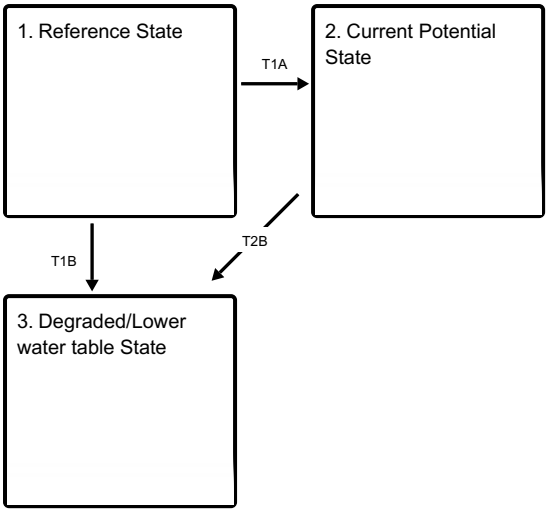
Ecological dynamics

Where management results in over use by livestock, coarse-fibered grass-like plants and forbs become dominant on this site. Thistles and dandelions are species likely to invade this site.

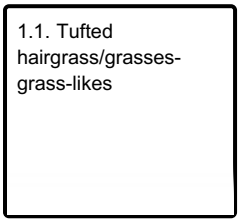
Fire Ecology:
Fire in wet meadow communities often only top-kills plants. Prescribed fires are most effective in late summer, early fall, or during dry years when the water is below the soil surface. The sedges have deep buried rhizomes which usually survive all but the most severe fires.
Tufted hairgrass generally survives all but the most severe fires. It usually sprouts from the root crown after aerial portions are burned. Tufts formed by the leaves often protect basal buds from fire damage. Tufted hairgrass seeds occur in the seedbank; after fire tufted hairgrass may regenerate from soil-stored seed.

State and transition model

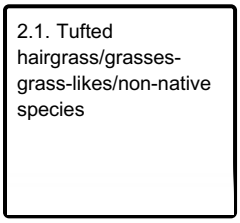
Ecosystem states



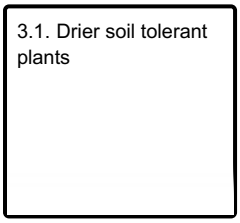
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1
Reference State

Community 1.1
Tufted hairgrass/grasses-grass-likes

The reference plant community is dominated by tufted hairgrass. Bluegrasses, sedges and rushes are important species associated with this site. Potential vegetative composition is about 80 percent grasses and grass-like plants and 20 percent forbs and shrubs. Approximate ground cover (basal and crown) is 75 to 85 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1440	1760	2800
Forb	324	396	630
Shrub/Vine	36	44	70
Total	**1800**	**2200**	**3500**

State 2
Current Potential State

The Current Potential State is similar to the Reference State except the plant communities have non-native species present. The presence of non-native species, especially those that are invasive, lowers the resistance and resiliency of the state. Invasive/non-native plants that can come in with a high water table are meadow foxtail (*Alopecurus arundinaceus*), quackgrass (*Elymus repens*), reed canarygrass (Phlaris arundinacea), and Kentucky bluegrass (*Poa pratensis*). These species are also more tolerant of grazing and can increase and may become dominant on the site.

Community 2.1
Tufted hairgrass/grasses-grass-likes/non-native species

Community Phase 2.1 is similar to Community Phase 1.1 with the exception of non-native plants establishment in the plant community.

State 3
Degraded/Lower water table State

The Degraded/Lower water table State develops after a permanent lowering of the water table. This can occur from excessive grazing that can cause meadow downcutting or through artificial meadow drainage to decrease soil saturation. State 1 and State 2 can transition to this state. The site has crossed the threshold. This state cannot be returned to State 1 without raising the water table.

Community 3.1
Drier soil tolerant plants

Plants that are adapted to drier soil conditions are present in this community phase. This can occur with continued improper grazing management. It may also occur with proper grazing on the site, but channel erosion may continue if poor off-site conditions because more frequent and/or severe flooding.

Transition T1A
State 1 to 2

Introduction of non-native plants.

Transition T1B
State 1 to 3

This transition can occur with artificial drainage of the site, which reduces the availability of water and reduces soil moisture.

Transition T2B
State 2 to 3

This transition can occur with artificial drainage of the site, which reduces the availability of water and reduces soil moisture.

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**			1254–2376	
	tufted hairgrass	DECE	*Deschampsia cespitosa*	660–1100	–
	sedge	CAREX	*Carex*	220–440	–
	bluegrass	POA	*Poa*	220–440	–
	meadow barley	HOBR2	*Hordeum brachyantherum*	110–220	–
	rush	JUNCU	*Juncus*	44–176	–
2	**Secondary Perennial Grasses**			110–330	
	sloughgrass	BECKM	*Beckmannia*	11–110	–
	mannagrass	GLYCE	*Glyceria*	11–110	–
	alpine timothy	PHAL2	*Phleum alpinum*	11–110	–
Forb					
3	**Perennial**			110–330	
	yarrow	ACHIL	*Achillea*	11–110	–
	aster	ASTER	*Aster*	11–110	–
	Rocky Mountain iris	IRMI	*Iris missouriensis*	11–110	–
	cinquefoil	POTEN	*Potentilla*	11–110	–
	buttercup	RANUN	*Ranunculus*	11–110	–
	blue-eyed grass	SISYR	*Sisyrinchium*	11–110	–
	clover	TRIFO	*Trifolium*	11–110	–
Shrub/Vine					
4	**Primary Shrubs**			44–110	
	Woods' rose	ROWO	*Rosa woodsii*	11–44	–
	willow	SALIX	*Salix*	11–44	–

Animal community

Livestock Interpretations:
This site is suited to livestock grazing. Grazing management should be keyed to tufted hairgrass production. Tufted hairgrass provides good to excellent forage for all classes of livestock. It is often an abundant source of forage throughout its growing season.

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:
Use of tufted hairgrass by wildlife species is variable. Tufted hairgrass forage value for wildlife has been rated fair to good.

Hydrological functions

Runoff is medium to very high with moderately slow to moderately rapid permeability.

Recreational uses

Aesthetic value is derived from the diverse floral and faunal composition. This site offers rewarding opportunities to photographers and for nature study. This site has potential for waterfowl and big game hunting.

Other information

Tufted hairgrass has a broad ecological range and is useful for revegetation, particularly on disturbances at high elevation or high latitude. Tufted hairgrass has been successfully established by seeding on alpine disturbances. It is a valuable soil stabilizer, especially in wet, acid locations.

Inventory data references

NASIS data for soil survey areas CA686, CA729, NV628, NV773, and NV799.

Type locality

Location 1: Mineral County, NV	
Township/Range/Section	T8N R28E S24
General legal description	Along the north fork of Cat Creek, Hawthorne Army Depot, Wassuk Range, Mineral County, Nevada.

Other references

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

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

Contributors

DK/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	05/11/2025
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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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):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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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:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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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:**
