Ecological site R023XY025NV
WET MEADOW 14+ P.Z.

Last updated: 4/10/2025
Accessed: 04/20/2026

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): 023X–Malheur High Plateau

Major Land Resource Area 23, known as the Malheur High Plateau, is 22,895 square miles (14.6 million acres) in size. Most of MLRA 23 is located in southeastern Oregon, with the remainder in northwestern Nevada and along the Nevada border in northeastern California. Elevation ranges from 3,900 – 6,900 feet in most of the area, but it exceeds 9,000 feet on some mountains. This MLRA consists of nearly level to moderately steep plateaus, basins, and valleys bordered by long, gently sloping alluvial vans. Occasional north-south fault-block mountain ranges separate the basins. Volcanic plateaus with basalt rock rims are common. Most of this are consists of young andesite and basalt layers. Basins between mountains are filled with alluvium, continental sediments, and volcanic ash. Playas or shallow seasonal lakes are common in the lowest areas within the closed basins. The dominant soil orders in MLRA 23 are Aridisols and Mollisols. Soils primarily have a mesic or frigid temperature regime, and aridic or xericmoisture regime. Soils tend to be loamy or clayey. The average annual precipitation is 6 – 12 inches, but can be as high as 57 inches in certain mountain ranges. This area experiences dry summers and receives most of its moisture throughout the fall, winter, and spring. Snow is common in winter. The average annual temperature is 39-52°F, decreasing with elevation. The freeze-free period averages 105 days, but ranges from 35 to 175 days along an elevation gradient.

LRU notes

This is a riparian site that occurs across LRUs.

Ecological site concept

This site occurs on floodplains adjacent to perennial streams and in wet areas associated with seeps and springs. Soils are poorly drained, are subject to flooding or ponding, and have a water table within 24 inches throughout the year. The vegetation is adapted to wet conditions.

Associated sites

F023XY034NV	**POBAT/SALIX/LEYMU** Deeper seasonal water table. Site is dominated by POTR.
R023XY009NV	**LOAMY BOTTOM 8-12 P.Z.** Soils are moderately well drained with flooding rare. Site is dominated by ARTRT.
R023XY013NV	**DRY MEADOW** Soils have ashy textures and are moderately well drained with flooding rare. Site is dominated by ARTRT.

Similar sites

R023XY013NV	**DRY MEADOW** Water table is less persistent, dominant grass is PONE3, and site is less productive.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Deschampsia cespitosa* (2) *Carex*

Physiographic features

This site occurs on floodplains adjacent to perennial stream channels and within the wetted perimeter of active seeps and flowing springs. Slopes range from 0 to 30 percent, but slope gradients of 0 to 2 percent are most typical. Elevations are 4800 to 8500 feet.

Table 2. Representative physiographic features

Landforms	(1) Intermontane basin > Flood plain (2) Mountains > Flood plain (3) Basin > Flood plain
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional
Ponding duration	Long (7 to 30 days)
Ponding frequency	None to frequent
Elevation	1,460 – 2,590 m
Slope	0 %
Ponding depth	0 – 20 cm
Water table depth	0 – 60 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate associated with this site is semiarid and characterized by cool, moist winters and warm, dry summers. Average annual precipitation is (12) 14 to over 18 inches. Mean annual air temperature is 45 to 50 degrees F. The average growing season is about 70 to 90 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).

Average annual precipitation is 16 to over 20 inches. Mean annual air temperature is 41 to 44 degrees F. The average growing season is about 50 to 70 days.

Table 3 Representative climatic features

Frost-free period (characteristic range)	80 days
Freeze-free period (characteristic range)	110 days
Precipitation total (characteristic range)	410-460 mm
Frost-free period (actual range)	80 days
Freeze-free period (actual range)	110 days
Precipitation total (actual range)	410-460 mm
Frost-free period (average)	80 days
Freeze-free period (average)	110 days
Precipitation total (average)	430 mm

- (1) DENIO 52 WSW [USW00004139], Gerlach, NV
- (2) FT BIDWELL [USC00043157], Cedarville, CA

Influencing water features

This site is associated with mountain streams, seeps and springs. It also may receive supplemental water as run in from adjacent sites. All of these supplemental sources can contribute to the site's high water table.

Soil features

The soils associated with this site are very deep and very poorly drained. Surface soils are high in organic matter, medium to heavy textured, and greater than 10 inches thick. Permeability is moderate to moderately slow, runoff is very high, and the available water capacity is very low to high. These soils have a water table within 24 inches of the surface throughout the growing season. The soil series associated with this site include: Clementine and Welch.

Table 4. Representative soil features

Parent material	(1) Alluvium – igneous rock
Surface texture	(1) Ashy loam (2) Silty clay loam (3) Muck
Family particle size	(1) Ashy (2) Fine-loamy
Drainage class	Very poorly drained to poorly drained
Permeability class	Moderately slow
Soil depth	180 – 210 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	1.52 – 20.83 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified

Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	6.1 – 7.8
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

This narrative is informed by data collected for MRLA 28 Wet Meadow sites in Idaho and Utah. Though documented abiotic features and vegetation align well for riparian meadow sites across MLRAs, field verification of this information is still needed.

The dominant visual aspect of the Wet Meadow 14+ PZ site is grass and sedges with scattered forbs and shrubs. The dominant plant community has tufted hairgrass, cinquefoils (Potentella spp.), and Carex species as major components. Minor components of the site include meadow barley (Hordeum brachyanththerum), Juncus spp, and clover (Trifolium spp.)

The soils within any complex of meadow sites are highly variable. Factors that affect the determination of the site include depth to water table at end of growing season, micro-topography and drainage class. Depth to water table and micro-topography are measurable features. Determination of drainage class requires the use of soil interpretation tables. Other interpretive factors that may be used for site determination are ponding frequency, depth and duration and flooding frequency, timing and duration.

Micro-topography is a feature that has a dramatic effect on depth to water table and the resulting plant communities. A few inches of change in surface elevation can change species composition and/ or production. Slightly undulating topography is common in meadow complexes, therefore, more than one site should be expected. Further development of the riparian meadow system is needed for MLRA 23.

Currently this site is developed with two states: the reference state and a degraded meadow state. additional field work may identify additional states.

The identified drivers of both community pathways and transitions are grazing and fire.

Where management results in abusive grazing use by livestock and/or feral horses, coarse-fibered grass-like plants and forbs become dominant on this site. Misuse use of this site can cause gully erosion, causing the water table to drop, reducing site productivity and changing plant community species composition toward more drought tolerant plants. Thistles 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. Sedge is top-killed by fire, with rhizomes protected by insulating soil. The rhizomes of sedge species may be killed by high-severity fires that remove most of the soil organic layer. Reestablishment after fire occurs by seed establishment and/or rhizomatous spread. Bluegrass is generally unharmed by fire. It produces little litter, and its small bunch size and sparse litter reduces the amount of heat transferred to perennating buds in the soil. Its rapid maturation in the spring also reduces fire damage, since it is dormant when most fires occur. Meadow barley has high fire tolerance. Meadow barley grows in moist habitats that experience infrequent fire. 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

Figure 7. R023XY025NV State and Transition Model

Figure 8. R023XY025NV STM Narrative

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/Grasslikes**			1529-2367	
	tufted hairgrass	DECE	*Deschampsia cespitosa*	1233-1603	–
	sedge	CAREX	*Carex*	123-247	–
	meadow barley	HOBR2	*Hordeum brachyantherum*	49-197	–
	bluegrass	POA	*Poa*	49-197	–
	rush	JUNCU	*Juncus*	74-123	–
2	**Secondary Perennial Grasses**			123-370	
	bentgrass	AGROS2	*Agrostis*	12-123	–
	sloughgrass	BECKM	*Beckmannia*	12-123	–
	reedgrass	CALAM	*Calamagrostis*	12-123	–
	spikerush	ELEOC	*Eleocharis*	12-123	–
	mannagrass	GLYCE	*Glyceria*	12-123	–
Forb					
3	**Perennial**			345-690	
	blue-eyed grass	SISYR	*Sisyrinchium*	12-74	–
	yarrow	ACHIL	*Achillea*	12-74	–
	aster	ASTER	*Aster*	12-74	–
	Rocky Mountain iris	IRMI	*Iris missouriensis*	12-74	–
	cinquefoil	POTEN	*Potentilla*	25-49	–
	buttercup	RANUN	*Ranunculus*	25-49	–
	clover	TRIFO	*Trifolium*	25-49	–
	arrowgrass	TRIGL	*Triglochin*	25-49	–
Shrub/Vine					
4	**Primary Shrubs**			1-49	
	rose	ROSA5	*Rosa*	12-25	–
	willow	SALIX	*Salix*	12-25	–

Table 6. Community 1.2 plant community composition

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

Table 7. Community 2.1 plant community composition

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

Animal community

Livestock Interpretations: This site is suitable for livestock grazing. Grazing management should be keyed to perennial grass 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. Sedge provides good to fair forage for domestic grazing. Bluegrass is a widespread forage grass. It is one of the earliest grasses in the spring and is sought by domestic livestock and several wildlife species. Bluegrass is a palatable species, but its production is closely tied to weather conditions. It produces little forage in drought years, making it a less dependable food source than other perennial bunchgrasses. Meadow barley tends to increase and replace the more palatable plants in moist meadows and in other sites favorable to growth, especially if such areas are somewhat overgrazed. Rush is described as a fair to good forage species for cattle. On

average, rush’s palatability is considered medium to moderately low. 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: Tufted hairgrass has a high to moderate resource value for elk and a medium value for mule deer. Use of tufted hairgrass by wildlife species is variable. Tufted hairgrass forage value for wildlife has been rated fair to good. Sedges have a high to moderate resource value for elk and a medium value for mule deer. Elk consume beaked sedge later in the growing season. Bluegrass is desirable for pronghorn antelope and mule deer in the spring and preferable in the spring, summer, and fall for elk and desirable as part of their winter range. Meadow barley is an important forage species for many wildlife species. Rush provides food for several wildlife species and waterfowl. Rush is an important cover species for a variety of small birds, upland game birds, birds of prey, and waterfowl.

Hydrological functions

Runoff is very high. Permeability is moderate to moderately slow.

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 rush were historically used by Native Americans as a foundation for coiled basketry.

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. 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.

Inventory data references

NRCS-ECS-5 3 NV-ECS-1 1NRCS-RANGE-417 NV-4400-13 (BLM)

Type locality

Location 1: Washoe County, NV	
Township/Range/Section	T42N R18E S1
UTM zone	N
UTM northing	256825
UTM easting	4608362
Latitude	41° 35□23□
Longitude	119° 55□2□

General legal description	SE 1/4 NE 1/4, About 1 mile southwest of Vya, Washoe County, Nevada. This site also occurs in Humboldt 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).

Central Nevada Riparian Field Guide, Weixelman et al USFS 1996.

Contributors

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Approval

Kendra Moseley, 4/10/2025

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	08/02/2011
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** **Rills are none.**

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2. **Presence of water flow patterns:** **Water flow patterns are none.**

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3. **Number and height of erosional pedestals or terracettes:** Pedestals are 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 +/- 5 to 15%.

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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 and perennial forbs) only expected to move during periods of flooding by adjacent streams. Persistent litter (large woody material) will remain in place except during catastrophic flooding events.

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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 4 to 6 (to 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 medium platy or moderately thin platy. Soil surface colors are dark (gray or grayish brown) epipedons. Organic matter can range from 2-3% for much of the upper 20 inches. (OM values derived from lab characterization data).

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Deep-rooted perennial grasses and/or rhizomatous grass-likes (i.e. rushes) slow runoff and increase infiltration.

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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):** Compacted layers are none. Subangular blocky or massive subsurface layers are not to be interpreted as compaction.

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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: Reference Plant Community: deep-rooted cool season perennial grasses and grasslike plants>rhizomatous grasses

    Sub-dominant: >>deep-rooted cool season perennial forbs=fibrous shallow-rooted cool season annual and perennial forbs>tall shrubs.

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Little to no decadence present.

14. **Average percent litter cover (%) and depth (in):** Between plant interspaces (+/-10-15%) and litter depth is >0.25 in.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season (through June) +/- 2200 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 thistle, knapweeds, tall whitetop (perennial pepperweed) and salt-cedar.

17. **Perennial plant reproductive capability:** All functional groups should reproduce in most years.