# Ecological site R027XY001NV
# WETLAND

Last updated: 6/03/2024
Accessed: 06/30/2024

## 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 Wetland site occurs along axial-stream floodplains, on the margins of floodplain playas and adjacent to springs, seeps, sloughs or ponds. Slope gradients of less than 1 percent are typical. Elevations are 3500 to about 5500 feet. The soils are very deep and somewhat poorly drained. The site is saturated throughout the growing season and water is ponded on the site for most of the year. Water ponded on the soils may be as much as two feet deep. These soils typically have organic matter accumulation on the soil surface.

## Associated sites

| | |
|---|---|
| R027XY005NV | **SALINE MEADOW** |
| R029XY004NV | **SALINE BOTTOM** |

## Similar sites

| | |
|---|---|
| R027XY004NV | **WET MEADOW 8-12 P.Z.**<br>TYPHA spp. absent; PONE3 codominant grass |
| R027XY069NV | **WET MEADOW 4-8 P.Z.**<br>POJU dominant grass; TYPHA spp. rare to absent |
| R027XY005NV | **SALINE MEADOW**<br>SPAI & DISP dominant plants |

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | Not specified |
| Shrub | Not specified |
| Herbaceous | (1) *Typha*<br>(2) *Eleocharis palustris* |

## Physiographic features

The Wetland site occurs along axial-stream floodplains, on the margins of floodplain playas and adjacent to springs, seeps, sloughs or ponds. Slope gradients of less than 1 percent are typical. Elevations are 3500 to about 5500 feet.

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Flood plain<br>(2) Playa<br>(3) Slough |
| Runoff class | Negligible to very high |

| | |
|---|---|
| Flooding duration | Long (7 to 30 days) |
| Flooding frequency | Occasional to frequent |
| Ponding duration | Long (7 to 30 days)  to very long (more than 30 days) |
| Ponding frequency | None to occasional |
| Elevation | 3,500–5,500 ft |
| Slope | 0–1% |
| Ponding depth | 0–36 in |
| Water table depth | 0–36 in |
| Aspect | Aspect is not a significant factor |

## Climatic features

The climate associated with this site is arid, characterized by cool, moist winters and hot, dry summers. Average annual precipitation is 4 to about 8(10) inches. Mean annual air temperature is 49 to 60 degrees F. The average growing season is about 120 to 220 days.

**Table 3. Representative climatic features**

| | |
|---|---|
| Frost-free period (characteristic range) | 100-102 days |
| Freeze-free period (characteristic range) | 127-140 days |
| Precipitation total (characteristic range) | 5 in |
| Frost-free period (actual range) | 99-103 days |
| Freeze-free period (actual range) | 124-143 days |
| Precipitation total (actual range) | 5 in |
| Frost-free period (average) | 101 days |
| Freeze-free period (average) | 134 days |
| Precipitation total (average) | 5 in |

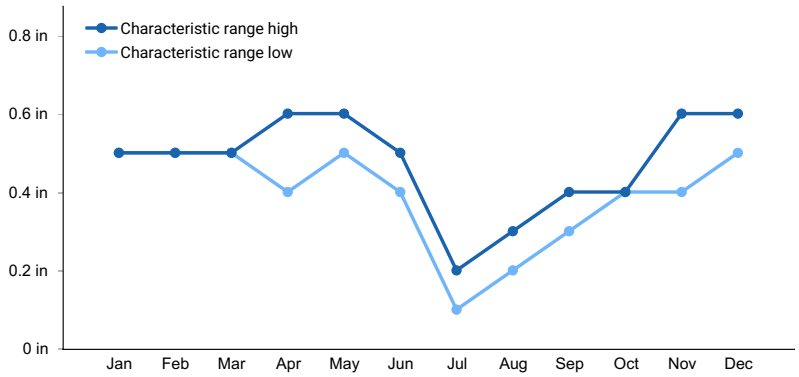



**Figure 1. Monthly precipitation range**

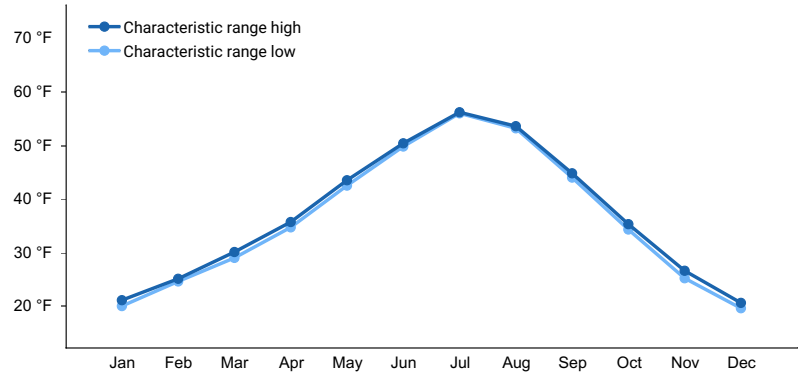



**Figure 2. Monthly minimum temperature range**

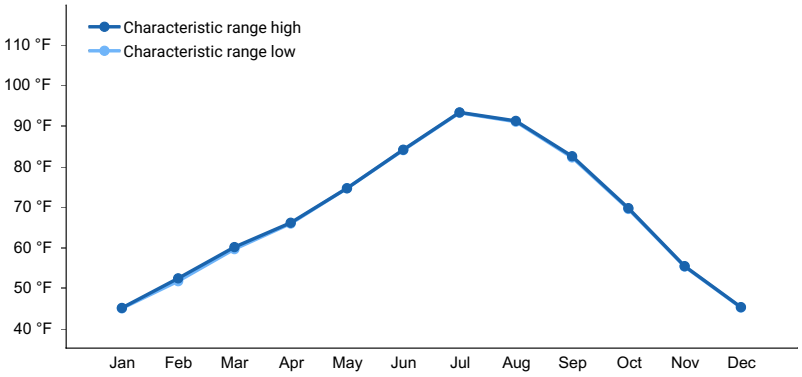



**Figure 3. Monthly maximum temperature range**

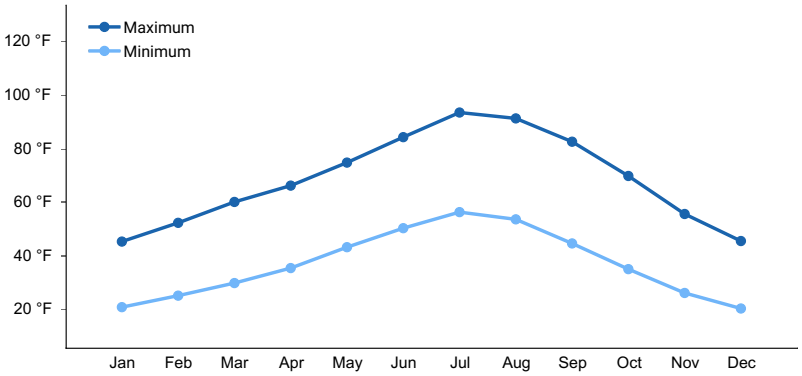



**Figure 4. Monthly average minimum and maximum temperature**

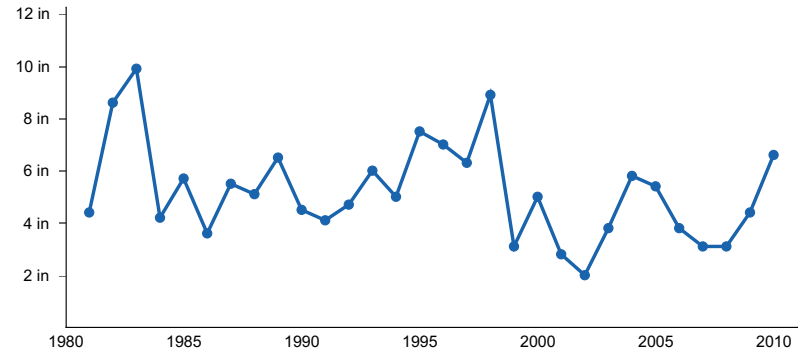



**Figure 5. Annual precipitation pattern**

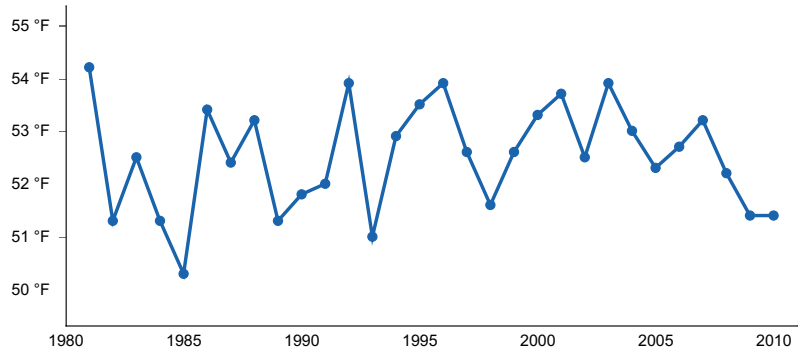



**Figure 6. Annual average temperature pattern**

## Climate stations used

- (1) WADSWORTH 4 N [USC00268838], Wadsworth, NV
- (2) FALLON EXP STN [USC00262780], Fallon, NV

## Influencing water features

This site may receive additional moisture by flooding and ponding due to its occurrence on axial stream floodplains, floodplain playas, and being adjacent to springs, seeps, sloughs, or ponds.

## Soil features

The soils associated with this site are very deep and somewhat poorly drained. These soils are typically deep, silt loam, alluvium derived from mixed rock sources. The soils are saturated throughout the growing season and water is ponded on the site for most of the year. Water ponded on the soils may be as much as two feet deep. These soils typically have a Histic epipedon. The soil series associated with this site include: Dia, Dithod, Fallon, Kolda, Mackerlake, Obanion, Pelic, and Rosecreek.

**Table 4. Representative soil features**

| | |
|---|---|
| Parent material | (1) Alluvium<br>(2) Lacustrine deposits |
| Surface texture | (1) Silt loam<br>(2) Loam<br>(3) Gravelly sand |
| Family particle size | (1) Loamy |
| Drainage class | Somewhat poorly drained |
| Permeability class | Very slow to rapid |
| Soil depth | 72–84 in |
| Surface fragment cover <=3" | 2–14% |
| Surface fragment cover >3" | 0% |
| Available water capacity (0-40in) | 2.5–8.3 in |
| Calcium carbonate equivalent (0-40in) | 0–40% |
| Electrical conductivity (0-40in) | 0–16 mmhos/cm |
| Sodium adsorption ratio (0-40in) | 0–35 |
| Soil reaction (1:1 water) (0-40in) | 6.6–9.6 |

| | |
|---|---|
| Subsurface fragment volume <=3" (Depth not specified) | 2–14% |
| Subsurface fragment volume >3" (Depth not specified) | 0% |

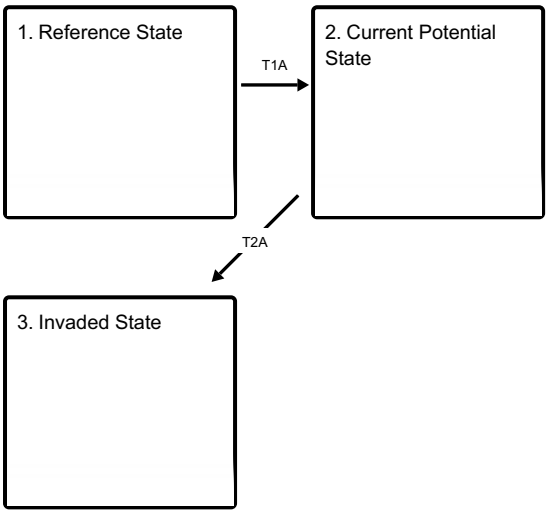
## Ecological dynamics

As ecological condition declines, "pioneer" or "early seral" forbs and grass-like plants, such as Baltic rush, become more prevalent.

Fire Ecology:
Fire in wetland communities often only top-kills plants. Wetland species have deep buried rhizomes which usually survive all but the most severe fires. Common cattail rhizomes are buried in the soil and are often under water where they cannot be harmed by the heat of fire. When above ground foliage is consumed by fire, common cattail quickly initiates new top-growth from these surviving underground regenerative organs.

## State and transition model

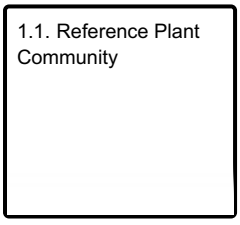
**Ecosystem states**



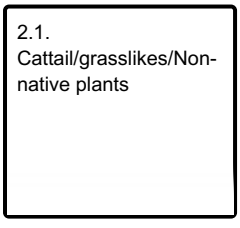

**T1A** - T1A - non-native plant species present

**T2A** - T2A - non-native species dominance

**State 1 submodel, plant communities**




**State 2 submodel, plant communities**



**State 3 submodel, plant communities**

3.1. Non-Native Species/Cattail/Native Grasslikes

## State 1
## Reference State

The Reference State is self sustaining and resistant to change due to its high resistance to natural disturbances and high resilience following natural disturbances. When natural disturbances occur, the rate of recovery is variable due to disturbance intensity. Prolonged flooding could cause a large plant die-off at any community phase. This community could become at risk where increased disturbance and/or the introduction of the invasive species of common reed occurs. Once this invasive species becomes established, return to the reference state may not be possible. Reference State: Community phases influenced by fluctuating water levels, natural disturbances, and weather. Indicators: A dense stand of common cattail, various bulrush species and the native sub-species of common reed dominant visual aspect. Feedbacks: Extended drought, lower standing water levels and/or other disturbances that reduce plant vigor which may allow invasive species to become established in the community. Properly managed water levels where possible help maintain the native perennial plant community. At-risk Community Phase: All communities in this state are at risk when native plants are stressed and/or nutrients become available for invasive plants to establish. Trigger: Introduction and establishment of non-native invasive plants such as the invasive sub-species of common reed.

## Community 1.1
## Reference Plant Community

The reference plant community is dominated by cattail, creeping spikerush, bulrush, common reed, sedges and other grass-like plants common to wetlands. Potential vegetative composition is about 90% grasses and grass-like plants and 10% forbs. Approximate ground cover of the mineral soil approaches 100 percent when an organic surface horizon (Histic epipedon)is present. Foliar cover is 75 to over 100 percent.

**Table 5. Annual production by plant type**

| Plant Type | Low (Lb/Acre) | Representative Value (Lb/Acre) | High (Lb/Acre) |
|---|---|---|---|
| Grass/Grasslike | 1740 | 2436 | 3480 |
| Forb | 200 | 280 | 400 |
| Shrub/Vine | 60 | 84 | 120 |
| **Total** | **2000** | **2800** | **4000** |

## State 2
## Current Potential State

The Current Potential State is similar to the Reference State with the addition of non-native species.

## Community 2.1
## Cattail/grasslikes/Non-native plants

The Common cattail/non-natives community is characterized by a perennial forb community dominated by common cattail and other obligate wetland plants. This community phase includes non-native plant species, but they do not dominate the site. This site normally has standing water during all of the growing season. Ground cover is highly variable with perennial vegetative cover ranging from 30 to 60 percent. Ponded water is also variable.

**Dominant plant species**

- common spikerush (*Eleocharis palustris*), grass
- cattail (*Typha*), other herbaceous

### State 3
### Invaded State

The Invaded State is similar to the Reference State, except that non-native and/or invasive species are present. This state is generally dominated by the invasive sub-species of common reed; however, depending on disturbance history, species native to this site may be lacking resulting in pure stands of common reed. Primary disturbance mechanisms include climate fluctuations, water level changes, and surface disturbances such as road and pipeline development and off road vehicle (OHV) use. Timing of these disturbances dictates the ecological dynamics that can occur. The invaded state is losing resistance to change and lower resilience following disturbances. Indicators: A site dominated by common cattail and several bulrush species including hardstem and 3-square. Both the native and introduced subspecies of common reed are now present in the stand. Feedbacks: Extended drought resulting in a reduction of native perennial plant vigor. Normal fluctuations in weather allowing for the maintenance of both perennial sedges and grasses. At-risk Community Phase: This state is at risk when perennial plant cover is reduced and nutrients become available for invasive plants to flourish. Trigger: Spread of invasive plants to fill available niches.

### Community 3.1
### Non-Native Species/Cattail/Native Grasslikes

The Non-Native Species/Cattail/Native Grasslikes Community Phase is characterized by a significant invasion of the non-native sub-species of common reed replacing perennial grass/sedge communities normally dominating this site. Native obligate wetland species may still be present if the water table has remained high. This site normally has standing water 1 to 6 inches deep during much or all of the growing season. All of these species are in danger of being eliminated and replaced by the non-native reed species. Ground cover is highly variable with perennial vegetative cover. Ponded water is also variable.

#### Dominant plant species

- reed canarygrass (*Phalaris arundinacea*), grass

### Transition T1A
### State 1 to 2

This transition occurs when non-native species are introduced, but not dominant.

### Transition T2A
### State 2 to 3

This transition is from the native perennial plant communities in the reference state to a state is dominated by invasive species. Events that allow for the establishment of invasive plant species include, prolonged drought, standing water level fluctuation, surface disturbances, etc. However, the invasive sub-species of common reed has been known to invade intact perennial plant communities with little to no disturbance. Once invasive species are found in the plant community a threshold has been crossed.

## 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** | | | 1204–3220 | |
| | cattail | TYPHA | *Typha* | 560–840 | – |
| | common spikerush | ELPA3 | *Eleocharis palustris* | 280–700 | – |
| | common reed | PHAU7 | *Phragmites australis* | 56–420 | – |
| | bulrush | SCIRP | *Scirpus* | 140–420 | – |
| | sedge | CAREX | *Carex* | 56–280 | – |
| | bulrush | SCHOE6 | *Schoenoplectus* | 56–280 | – |
| | rush | JUNCU | *Juncus* | 56–280 | – |
| 2 | **Secondary Perennial Grasses** | | | 140–420 | |
| | saltgrass | DISP | *Distichlis spicata* | 14–56 | – |
| | scratchgrass | MUAS | *Muhlenbergia asperifolia* | 14–56 | – |
| | alkaligrass | PUCCI | *Puccinellia* | 14–56 | – |
| | Nevada bulrush | SCNE | *Scirpus nevadensis* | 14–56 | – |
| | arrowgrass | TRIGL | *Triglochin* | 14–56 | – |
| **Forb** | | | | | |
| 3 | **Perennial** | | | 140–420 | |
| | European water plantain | ALPL | *Alisma plantago-aquatica* | 14–84 | – |
| | sea milkwort | GLMA | *Glaux maritima* | 14–84 | – |
| | pondweed | POTAM | *Potamogeton* | 14–84 | – |
| | western coneflower | RUOC2 | *Rudbeckia occidentalis* | 14–84 | – |
| | broadleaf arrowhead | SALA2 | *Sagittaria latifolia* | 14–84 | – |
| 4 | **Annual** | | | 56–140 | |
| | goosefoot | CHENO | *Chenopodium* | 14–84 | – |
| | saltmarsh bird's-beak | COMA5 | *Cordylanthus maritimus* | 14–84 | – |
| | nodding waternymph | NAFL | *Najas flexilis* | 14–84 | – |
| **Shrub/Vine** | | | | | |
| 5 | **Secondary Shrubs** | | | 0–84 | |
| | Woods' rose | ROWO | *Rosa woodsii* | 14–28 | – |
| | willow | SALIX | *Salix* | 14–28 | – |
| | greasewood | SAVE4 | *Sarcobatus vermiculatus* | 14–28 | – |

## Animal community

Livestock Interpretations:
This site is suitable for livestock grazing. Grazing management should be keyed to sedge production. Common cattail is generally considered poor livestock forage. These animals rarely graze common cattail unless upland forage becomes scarce. Common spikerush is of minimal importance to livestock. In riparian areas, the seasonally wet conditions and low palatability of common spikerush limit its grazing value, even in years of drought where upland forage dries early and dies. 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. Common reed is moderately tolerant of grazing, but prolonged heavy grazing tends to reduce the extent and size of stands. Sedge provides good to fair forage for domestic grazing.

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:
Common cattail rootstocks are much more valuable as food for wildlife than are the seeds. Geese and muskrats use the starchy underground stems a great deal. Cattails also provide valuable shelter and nesting cover for several species of songbirds. For ducks, cattails have relatively little value. They furnish cover but they also take the place of more useful plants that would furnish both food and cover. Common spikerush is an important source of food for waterfowl. The seeds, stems, and rhizomes of common spikerush are an important food source for a variety of North American waterfowl, marsh, and shorebirds. Common spikerush provides cover for a variety of waterfowl and small mammals. 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. Common reed provides shade, nesting, and cover habitat for mammals, waterfowl, song birds, and fishes. Common reed is not rated as a high-value wildlife food unless plants are young. 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.

## Hydrological functions

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

## 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 is used for has potential for bird hunting.

## Other products

Native Americans used common cattail as food. Rhizomes were dried and ground into flour or eaten as cooked vegetables; young stems were eaten raw or cooked; and immature fruiting spikes were eaten after roasting. The leaves were woven for matting and the "soft down" from ripe fruiting heads was used as padding and in diapers. Common reed was utilized as a food source and as a medicine by Native Americans. Shoots were eaten raw or cooked. Flour was made from dried shoots and rhizomes. Common reed rhizomes provided a year-round food source. Seeds were harvested and ground into a high fiber meal. The plant material was used to construct pipestems, arrows, mats, nets, and prayer sticks.

## Other information

Native Americans used common cattail as food. Rhizomes were dried and ground into flour or eaten as cooked vegetables; young stems were eaten raw or cooked; and immature fruiting spikes were eaten after roasting. The leaves were woven for matting and the "soft down" from ripe fruiting heads was used as padding and in diapers. Cattails were used for thatching their homes and making ropes. Cattails and tules provided the materials for making boats, duck decoys, nets, storage bags, and baskets. Common spikerush has high erosion control potential in riparian and wetland areas. 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. Ease of establishment, rapid vegetative spread, and high tolerance of disturbance make common reed an understandable choice for rehabilitation. However, these same traits make common reed a nuisance or weedy species in some areas. In natural or wild areas, the use of native common reed haplotypes may be required or preferred.

## Inventory data references

NASIS soil component data.

## Type locality

| Location 1: Churchill County, NV | |
|---|---|
| Township/Range/Section | T21N R25E S2634 |
| General legal description | Fernley Wildlife Management Area along east side of Interstate 80, Churchill County, Nevada. This site also occurs in Humboldt, Lyon, and Mineral 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

GED
Sarah Quistberg (STM)

## 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 | 06/30/2024 |
| 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:**

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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:**

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