

# Ecological site R023XY610OR

## PUMICE DUNES

### 8-10 PZ

Last updated: 4/10/2025  
Accessed: 09/18/2026

#### 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.

#### Ecological site concept

Currently there is only a draft of the initial concept for this ecological site. The initial concept for this site places it within the Stabilized Sand Dunes with Sagebrush and Saltbrush Ecological Site Group. To view the General STM and other information available for this ESG please go to <https://edit.jornada.nmsu.edu/catalogs/esg/023X/R023XY914NV>

Table 1. Dominant plant species

|            |               |
|------------|---------------|
| Tree       | Not specified |
| Shrub      | Not specified |
| Herbaceous | Not specified |

#### Physiographic features

This site occurs in large lake basins and valleys, usually as isolated local dunes systems but sometimes as part of beach ridges. Slopes typically range from 1-20% but occasionally reach 40%. Elevations range from 4300-4500 feet.

Table 2. Representative physiographic features

|           |                                    |
|-----------|------------------------------------|
| Landforms | (1) Dune<br>(2) Beach ridge        |
| Elevation | 1,310 – 1,370 m                    |
| Slope     | 0 – 20 %                           |
| Aspect    | Aspect is not a significant factor |

#### Climatic features

The annual precipitation averages 8-10 inches, most of which occurs during the months of October through March. The mean annual air temperature is 48 degrees F. Temperature extremes range from 110 to -30 degrees F. The frost free period is 50-70 days. The period for optimum plant growth is from April through June.

**Table 3 Representative climatic features**

|                               |          |
|-------------------------------|----------|
| Frost-free period (average)   | 70 days  |
| Freeze-free period (average)  | 100 days |
| Precipitation total (average) | 250 mm   |

## Influencing water features

### Soil features

The soils of this site are very deep, somewhat excessively drained and coarse (sandy) textured. They are generally formed in eolian material high in ash deposited or re-deposited over lacustrine sediments. Permeability is rapid over moderate and the available water holding capacity is 4-6 inches for the profile. The potential for water erosion is low and wind erosion is high.

**Table 4. Representative soil features**

|                                             |                              |
|---------------------------------------------|------------------------------|
| Surface texture                             | (1) Ashy sand                |
| Family particle size                        | (1) Sandy                    |
| Drainage class                              | Somewhat excessively drained |
| Permeability class                          | Moderate to rapid            |
| Soil depth                                  | 180 cm                       |
| Available water capacity<br>(0-101.6cm)     | 10.16 – 15.24 cm             |
| Calcium carbonate equivalent<br>(0-101.6cm) | Not specified                |
| Electrical conductivity<br>(0-101.6cm)      | Not specified                |
| Sodium adsorption ratio<br>(0-101.6cm)      | Not specified                |

|                                          |    |
|------------------------------------------|----|
| Soil reaction (1:1 water)<br>(0-101.6cm) | 10 |
|------------------------------------------|----|

## Ecological dynamics

The potential native plant community is slow to develop in some active dune systems so the cover is described in developmental stages. The stable high condition stage is dominated by basin big sagebrush and Indian ricegrass. Gray rabbitbrush and small green rabbitbrush are common. Minor amounts of creeping wildrye and bottlebrush are present. Less stable dunes in midseral stage have little or no shrub cover, but moderate or dense grass cover. Indian ricegrass usually dominates but in some cases creeping wildrye is the primary species. Unstable dunes in early seral stages are mostly bare with only scattered vegetative cover.

Saline Phase-

The potential native plant community is slow to develop in some active dune systems so the cover is described in developmental stages. The stable high condition stage is dominated by Basin big sagebrush and Basin wildrye. Other shrubs common in the stand are Gray rabbitbrush, Threadleaf rabbitbrush, and small Green rabbitbrush. Black greasewood is occasionally present as well. A variety of other grasses occur in less abundance including Indian ricegrass, inland saltgrass, western needlegrass, creeping wildrye, bottlebrush squirreltail, and rarely needleandthread. Less stable dunes in midseral stage have little or no shrub cover, but moderate grass cover. In this case, basin wildrye may dominate or a mix of several of the adapted grasses occurs. Unstable dunes in early seral stages are mostly bare with only scattered vegetative cover.

## State and transition model

### Additional community tables

Table 5. Community 1.1 plant community composition

| Group                  | Common Name          | Symbol | Scientific Name                                                         | Annual Production () | Foliar Cover (%) |
|------------------------|----------------------|--------|-------------------------------------------------------------------------|----------------------|------------------|
| <b>Grass/Grasslike</b> |                      |        |                                                                         |                      |                  |
| 1                      |                      |        |                                                                         | 102-168              |                  |
|                        | Indian ricegrass     | ACHY   | <i>Achnatherum hymenoides</i>                                           | 91-137               | –                |
|                        | western needlegrass  | ACOCO  | <i>Achnatherum occidentale ssp. occidentale</i>                         | 6-16                 | –                |
|                        | needle and thread    | HECO26 | <i>Hesperostipa comata</i>                                              | 6-16                 | –                |
| 2                      |                      |        |                                                                         | 27-62                |                  |
|                        | beardless wildrye    | LETR5  | <i>Leymus triticoides</i>                                               | 16-30                | –                |
|                        | squirreltail         | ELEL5  | <i>Elymus elymoides</i>                                                 | 6-16                 | –                |
|                        | basin wildrye        | LECI4  | <i>Leymus cinereus</i>                                                  | 6-16                 | –                |
| <b>Forb</b>            |                      |        |                                                                         |                      |                  |
| 3                      |                      |        |                                                                         | 0-1                  |                  |
| <b>Shrub/Vine</b>      |                      |        |                                                                         |                      |                  |
| 4                      |                      |        |                                                                         | 64-171               |                  |
|                        | basin big sagebrush  | ARTRT  | <i>Artemisia tridentata ssp. tridentata</i>                             | 50-101               | –                |
|                        | yellow rabbitbrush   | CHVIS5 | <i>Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus</i> | 3-17                 | –                |
|                        | rubber rabbitbrush   | ERNA10 | <i>Ericameria nauseosa</i>                                              | 3-17                 | –                |
|                        | greasewood           | SAVE4  | <i>Sarcobatus vermiculatus</i>                                          | 0-17                 | –                |
|                        | spineless horsebrush | TECA2  | <i>Tetradymia canescens</i>                                             | 7-17                 | –                |

## Animal community

Grazing- Grazing of sand dunes must be coordinated with the management of adjacent sites and should be carefully monitored under a planned grazing system. For grazing by cattle, Indian ricegrass is the key species. In the saline phase, Basin wildrye is the key species, but is considered less palatable than ricegrass. Overgrazing may reduce plant cover and increase wind erosion. The soils of dunes can be damaged by foot traffic and poor grazing management, resulting in increased soil movement. Wildlife-This site is commonly used by rabbits, rodents, and an assorted variety of birds and thier associated avian and terrestrial predators.

## Hydrological functions

The soils of this site have rapid infiltration rates and low runoff potential.

## Other information

Pumice dunes do not typically contain greasewood except where they are adjacent to flats containing greasewood. Evidently salty soils of greasewood stands are the source of windblown materials which raises the pH. They also provide the seed sources for the greasewood in the dunes. In addition to plant cover differences related to the developmental stages of the dunes, composition varies with aspect and with position on larger, steeper dunes. On some dunes, saltgrass is more common on the mid-slopes and toe positions, while basin wildrye is more abundant on leeward slopes. Windward slopes are generally more scoured from active erosion and have less cover. These and other differences make sampling and characterization difficult. Stable, high condition, well vegetated Pumice Dunes with a flattened form resemble and begin to blend with the Droughty Bottom 8-10 site. This makes them difficult to separate vegetatively, especially if the droughty bottom site is hummocky. Burning results in a loss of sagebrush and normally resprouting of other shrubs such as rabbitbrush. However, increases in wind erosion after a fire could damage other shrubs as well. Basin wildrye would normally be stimulated by a fire and possibly ricegrass unless the root crowns are damaged and wind scouring increases root damage exposure. Some minor invasion by cheatgrass may occur. The potential for artificial seeding is low because of the severity of the site and the difficulty in finding a satisfactory method of seeding. Broadcast seeding with or without some form of seed covering would be possible but not necessarily feasible. Indian ricegrass is a native species, commercially available, and well adapted to the site and to somewhat deep soil cover over the seed.

## 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)                    |                   |
| Contact for lead author                     |                   |
| Date                                        | 09/18/2026        |
| Approved by                                 |                   |
| 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:

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