

Ecological site R023XY613OR PUMICE NORTH SLOPES 10-12 PZ

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.

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 Loamy 10-20 PZ Mountain Big Sagebrush and Bluebunch Wheatgrass 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/R023XY905NV>

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on moderately steep north facing slopes of canyons, buttes, and ridges and sideslopes of upland plateaus. Slopes range from 15-50% but are typically from 30-60%. Elevations range from 2500-4500 feet.

Table 2. Representative physiographic features

Landforms	(1) Canyon (2) Butte (3) Plateau
Elevation	760 – 1,370 m
Slope	20 – 50 %
Aspect	N

Climatic features

The annual precipitation averages 10-15 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 period for optimum plant growth is from April

through July.

Table 3 Representative climatic features

Frost-free period (average)	120 days
Freeze-free period (average)	150 days
Precipitation total (average)	310 mm

Influencing water features

Soil features

The soils of this site have sandy (pumice) surface layers and loamy subsoils. They are moderately deep and usually stony and well-drained. Colluvial rock material limits the effective depth to less than 30 inches. Depth of bedrock ranges from 20-40 inches. Permeability is moderately rapid and the available water holding capacity is 3-6 inches for the profile. The potential for water erosion is low and wind erosion is high.

Table 4. Representative soil features

Surface texture	(1) Sand
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately rapid
Soil depth	0 – 80 cm
Available water capacity (0-101.6cm)	7.62 – 15.24 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)	10
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Ecological dynamics

Five states have been identified for this site: a reference state; a state with the presence of annuals; a state that has Juniper dominating site resources; a state that is Juniper dominant; and a state with annual dominance.

Reference: Plant community phase change is driven by fire. Mountain and basin big sagebrush declines after fire while Idaho fescue, Thurber's needlegrass and other grasses increase. May see a temporary increase in rabbitbrush after fire. Time facilitates the reintroduction of sagebrush. The introduction of invasive annual grasses and forbs transitions into the state 2.

State 2: Compositionally similar to the reference state with a trace of cheatgrass and the annual weeds. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of invasive weeds. Prescribed grazing maintains state dynamics. Mismanagement of grazing favors sagebrush and Sandberg's bluegrass. Cheatgrass increases. Prescribed grazing can reverse the trend. Reduction in fire frequency facilitates juniper encroachment in both poor and good condition communities. Fire reduces or eliminates juniper and with time sagebrush reestablishes. Juniper is out-competing sagebrush and the herbaceous plant community which brings the site to state 3.

State 3: Juniper dominates site resources. Sagebrush is dead or dying and bitterbrush lacks vigor. Sandberg's bluegrass is the dominant species in the interspace and bare ground is significant. The perennial grass component is significantly reduced in both density and productivity. Idaho fescue may be present under the canopy of trees (north slope typically). Spatial and temporal energy capture and nutrient cycling has been truncated. Infiltration may be reduced due to lack of ground cover. Juniper woodland development is complete and soil loss and erosion drive site processes as the site goes into state 4.

State 4: Juniper dominated state. Soil loss is evident and erosion is active. All ecological processes, hydrologic cycle, nutrient cycle and energy capture have been significantly changed preventing the establishment of perennial plants. An abiotic threshold has been crossed. With catastrophic wildfire, state 5 is achieved.

State 5: Cheatgrass dominated plant community with limited to no shrub or perennial grass component. Soil erosion and redistribution along with changes in dynamic soil properties affect the hydrologic cycle and thus the nutrient cycle. Harsh environmental factors increase state resiliency to change.

State and transition model

Figure 1. Group 8, STM

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1				555-757	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	454-555	–
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata ssp. spicata</i>	101-202	–
2				121-262	
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	20-50	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	20-50	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	20-50	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	20-50	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	20-30	–
	western needlegrass	ACOCO	<i>Achnatherum occidentale ssp. occidentale</i>	20-30	–
3				20-50	
	Ross' sedge	CARO5	<i>Carex rossii</i>	20-50	–

Forb					
4				9-36	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	1-3	-
	pearly everlasting	ANAPH	<i>Anaphalis</i>	1-3	-
	Indian paintbrush	CASTI2	<i>Castilleja</i>	1-3	-
	buckwheat	ERIOG	<i>Eriogonum</i>	1-3	-
	western stoneseed	LIRU4	<i>Lithospermum ruderales</i>	1-3	-
	broomrape	OROBA	<i>Orobanche</i>	1-3	-
	phlox	PHLOX	<i>Phlox</i>	1-3	-
	deathcamas	ZIGAD	<i>Zigadenus</i>	1-3	-
Shrub/Vine					
5				13-40	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	13-40	-
6				3-13	
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	3-13	-
	buckwheat	ERIOG	<i>Eriogonum</i>	3-13	-
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	3-13	-
	wax currant	RICE	<i>Ribes cereum</i>	3-13	-
	spineless horsebrush	TECA2	<i>Tetradymia canescens</i>	3-13	-
Tree					
7				3-13	
	western juniper	JUOC	<i>Juniperus occidentalis</i>	3-13	-

Animal community

Livestock- This site is suited for use by cattle, sheep, and horses under a planned grazing system in the spring, summer and fall. Wildlife- This site is commonly used by mule deer, rabbits, rodents, an assorted variety of birds and their associated avian and terrestrial predators.

Hydrological functions

The soils of this site have slow to very rapid runoff potential. The hydrologic cover is fair when ecological condition is high. The hydrologic soils group is B.

Wood products

This site is susceptible to invasion by western juniper. If this occurs, it can provide firewood and fence posts and specialty products.

Other information

Adapted species for seedings include bluebunch wheatgrass, crested wheatgrass, and Siberian wheatgrass. Bluebunch wheatgrass increases as the aspect becomes more westerly or easterly. Antelope bitterbrush may increase as precipitation approaches 12 inches. If the condition of the site deteriorates as a result of overgrazing, Idaho fescue decreases while bluebunch wheatgrass and Thurber needlegrass increase. Idaho fescue is the preferred species during the spring and summer. With further deterioration, bunchgrasses decrease and rabbitbrush and juniper increase, and may dominate the site under poor conditions. Excessive erosion in the bare interspaces markedly reduces the site productivity and contributes to downstream sedimentation.

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	04/20/2026
Approved by	
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:

17. Perennial plant reproductive capability:
