USDA Natural Resources
Conservation Service

Ecological site R023XY606OR
SHRUBBY PUMICE PLAINS 8-11 PZ

Last updated: 4/10/2025
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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 Clayey Mesic Plateaus 8-14 PZ Wyoming Big Sagebrush and Thurber's Needlegrass 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/R023XY909OR

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on very broad low ridges in large basins and on old lake terraces at the edge of basins, often associated with gentle toe slopes below rims or ridges. Slopes range from 0-20%, but are typically 0-3%. Elevations range from 4300 to 4800 feet.

Table 2. Representative physiographic features

Landforms	(1) Basin floor (2) Ridge (3) Terrace
Elevation	1,311–1,463 m
Slope	0–20%

Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation averages 8-11 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 early June. Some fall growth can occur during October and November if these months are unusually warm and moist.

Table 3. Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	120 days
Precipitation total (average)	279 mm

Influencing water features

Soil features

The soils of this site are typically deep or moderately deep, somewhat excessively drained and loamy sandy or gravelly loamy sand in texture. They are generally formed from wind deposited volcanic ash/pumice and gravelly lacustrine deposits. Permeability is rapid to very rapid and the available water holding capacity for the soil profile is 3 to 7 inches.

Table 4. Representative soil features

Surface texture	(1) Loamy sand (2) Gravelly loamy sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained
Permeability class	Rapid to very rapid
Soil depth	0 cm
Available water capacity (0-101.6cm)	7.62–17.78 cm
Calcium carbonate equivalent (0-101.6cm)	2%
Electrical conductivity (0-101.6cm)	0 mmhos/cm

Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7

Ecological dynamics

The potential native plant community is dominated by mountain big sagebrush, antelope bitterbrush, and needleandthread. Thurber needlegrass, bottlebrush squirreltail, and Indian ricegrass are the other prominent grasses along with Ross Sedge. Other shrubs common in the stand are gray rabbitbrush and low green rabbitbrush.
Basin big sagebrush replaces mountain big sagebrush at the eastern edge of its range or warm droughty locations. Idaho fescue is present in small amounts at moist locations or positions, especially where transitional to Idaho fescue communities.
Needleandthread is a decreaser under heavy grazing pressure by cattle or horses. Ricegrass and Thurber needlegrass also decline with overgrazing. Excessive browsing of bitterbrush over several seasons will reduce plant vigor/production and eventually reduce the stand. Invaders such as cheatgrass, cryptantha, salsify and mustard may enter low condition areas. Fire kills or severly damages big sagebrush and bitterbrush, while stimulating the recovery of rabbitbrush through resprouting. Early summer burns cause high mortality in needleandthread, but much less or little in late summer or fall. Thurber needlegrass suffers high mortality from burns throughout the summer.

State and transition model

Ecosystem states

1. Historic Climax Plant Community

State 1 submodel, plant communities

1.1. Historic Climax Plant Community

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

HCPC

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	560	644	729
Shrub/Vine	336	392	448
Forb	56	84	112
Total	**952**	**1120**	**1289**

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				200–387	
	needle and thread	HECO26	*Hesperostipa comata*	161–323	–
	western needlegrass	ACOCO	*Achnatherum occidentale ssp. occidentale*	33–45	–
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	6–19	–
2				38–92	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	13–33	–
	squirreltail	ELEL5	*Elymus elymoides*	6–19	–
	Idaho fescue	FEID	*Festuca idahoensis*	6–13	–
	beardless wildrye	LETR5	*Leymus triticoides*	7–13	–
	bluebunch wheatgrass	PSSPS	*Pseudoroegneria spicata ssp. spicata*	7–13	–
3				13–33	
	Ross' sedge	CARO5	*Carex rossii*	13–33	–
Forb					
4				11–30	

	common yarrow	ACMI2	*Achillea millefolium*	1–3	–
	rockcress	ARABI2	*Arabis*	1–3	–
	Indian paintbrush	CASTI2	*Castilleja*	1–3	–
	Douglas' dustymaiden	CHDO	*Chaenactis douglasii*	1–3	–
	common woolly sunflower	ERLAG	*Eriophyllum lanatum var. grandiflorum*	1–3	–
	phacelia	PHACE	*Phacelia*	1–3	–
	Cascade knotweed	POCA9	*Polygonum cascadense*	1–3	–
	fleabane	ERIGE2	*Erigeron*	1–2	–
	woollypod milkvetch	ASPU9	*Astragalus purshii*	1–2	–
	milkvetch	ASTRA	*Astragalus*	1–2	–
Shrub/Vine					
5				103–238	
	mountain big sagebrush	ARTRV	*Artemisia tridentata ssp. vaseyana*	39–78	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	39–78	–
	yellow rabbitbrush	CHVIS5	*Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus*	8–20	–
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	8–20	–

Animal community

Livestock- This site is suited for spring grazing by cattle and horses under a planned grazing system. Needleandthread, Thurber needlegrass and Indian ricegrass are the key speices for management in high condition stands. After maturity of needleandthread, the sharp needle-like seeds can cause mouth injuries to livestock.
Wildlife- This site is commonly used by rabbits, rodents, and assorted variety of birds and their associated avian and terrestrial predators.

Hydrological functions

The soils of this site have a high infiltration rate and a low runoff potential. The hydrologic cover is good when ecological conditionis high. The hydrologic soil group is A.

Contributors

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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	12/07/2025
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:**

   _____

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:**
