USDA Natural Resources
Conservation Service

Ecological site R023XY076NV
LOAMY HILL 10-14 P.Z.

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 Loamy Aridic Plateaus Low Production Wyoming and Lahontan Sagebrush sites w Sparse Juniper 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/R023XY910NV

This site is more productive than the modal site with 350 lbs/ac in normal years. This site occurs on summits and sideslopes of hills and low elevation plateaus and mountains. Although the site may be found on all aspects, at lower elevation the site is restricted to north-facing slopes. This site occurs at higher elevations than the modal site at 5000 to 7000 ft. The soils are very similar to the modal site but this site’s grass community is dominated by Salmon wildrye (Leymus salinas ssp. salmonis) and bottlebrush squirreltail. This shrub community on this site is dominated by Wyoming big sagebrush and may have Utah juniper with a canopy cover up to 10%. This model is similar to the modal site with four
stable states

Associated sites

R023XY075NV	**SHALLOW HILL 10-12 P.Z.**
R023XY077NV	**SHALLOW LOAM 10-14 P.Z.**

Similar sites

R023XY077NV	**SHALLOW LOAM 10-14 P.Z.** less productive site
R023XY075NV	**SHALLOW HILL 10-12 P.Z.** ARARL3 dominant shrub; less productive site
F023XY046NV	**JUOS/ARTRTW8/ACTH7/ACSP12** JUOS canopy cover greater than 10%

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata ssp. wyomingensis*
Herbaceous	(1) *Leymus salinus ssp. salmonis*

Physiographic features

This site occurs on summits and sideslopes of hills and low elevation mountains. Although the site may be found on all aspects, at lower elevations the site is restricted to north-facing slopes. Slope gradients of 30 to 75 percent are typical. Elevations are 5500 to 6000 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Hill
Elevation	1,676–1,829 m
Slope	30–75%
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 10 to 14 inches. Mean annual air temperature is 46 to 50 degrees F. The average growing season is about 80 to 110 days.

Table 3. Representative climatic features

Frost-free period (average)	110 days
Freeze-free period (average)	
Precipitation total (average)	356 mm

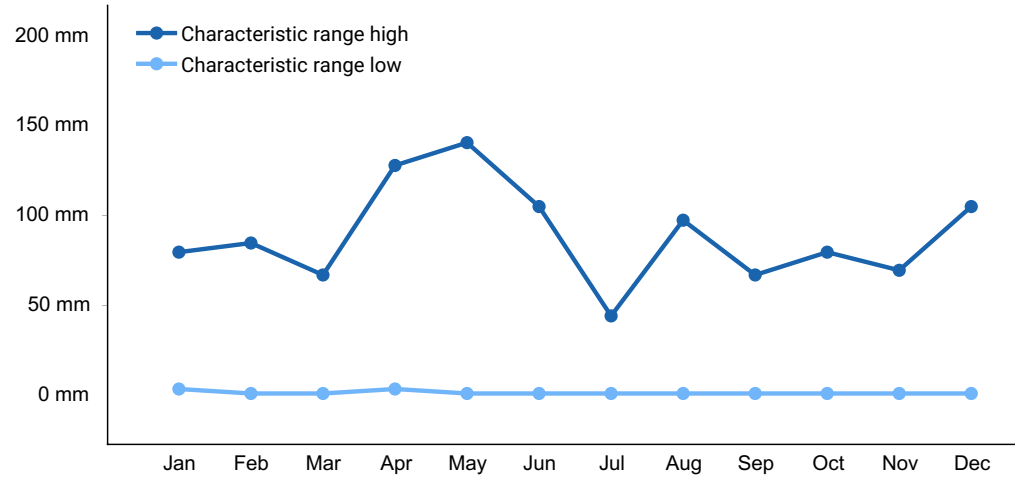

Figure 1. Monthly precipitation range

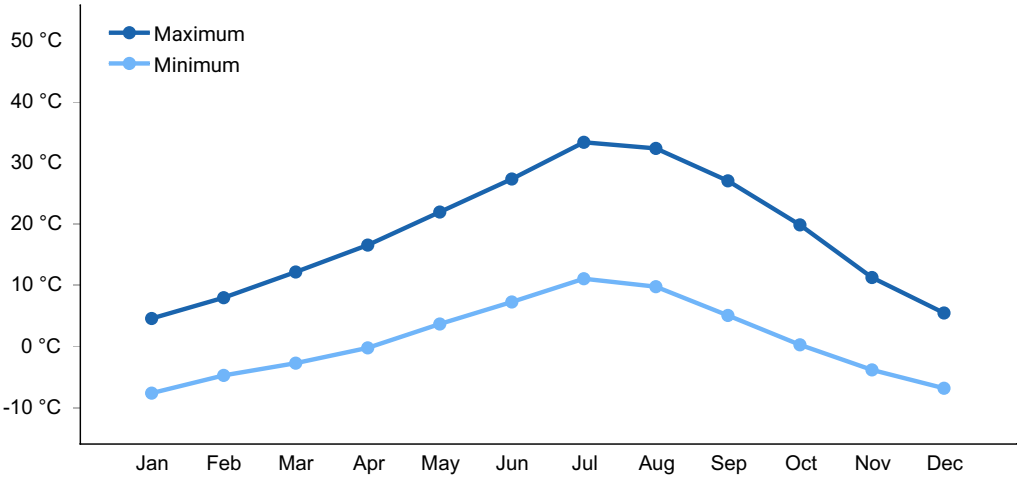

Figure 2. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are very shallow and shallow and have formed in residuum and colluvium from extrusive igneous rocks. The soil surface is medium in texture over a fine-textured subsoil. Permeability is moderate and the soils are well drained. Available water capacity is very low. Runoff is very high and the potential for sheet and rill erosion is high. The soils have high amounts of gravel and/or cobbles on the surface which provide a stabilizing affect on surface erosion conditions. The soil series associated with this site include: Skedaddle.

Table 4. Representative soil features

Surface texture	(1) Very stony loam

Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	10–30 cm
Surface fragment cover <=3"	25–30%
Surface fragment cover >3"	25–26%
Available water capacity (0-101.6cm)	2.03–2.29 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	20–30%
Subsurface fragment volume >3" (Depth not specified)	5–25%

Ecological dynamics

As ecological condition declines, Wyoming big sagebrush, rabbitbrush, bottlebrush squirreltail, and Sandberg bluegrass increase as Salmon wildrye, Thurber needlegrass and other desirable forage grasses decrease.

Fire Ecology:
The fire return interval for Wyoming big sagebrush communities ranges from 10 to 70 years. Fire is the principal means of renewal for decadent stands of Wyoming big sagebrush. Wyoming big sagebrush is killed by fire and establishes after fire from a seedbank; from seed produced by remnant plants that escaped fire; and from plants adjacent to the burn that seed in. Common pricklygilia is severly damaged by fire. Little is known regarding the specific relationship between Salmon wildrye and fire. Salmon wildrye can survive fire via its root crown and rhizomes. Bottlebrush squirreltail's small size, coarse stems, and sparse leafy material aid in its tolerance of fire. Postfire regeneration occurs from surviving root crowns and from on- and off-site seed sources. Frequency of disturbance greatly influences postfire response of bottlebrush squirreltail. Undisturbed plants within a 6 to 9 year age class generally contain large amounts of dead material, increasing bottlebrush squirreltail's susceptibility to fire. Sandberg 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.

State and transition model

Ecosystem states

1. Reference Plant Community

State 1 submodel, plant communities

1.1. Reference Plant Community

State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The reference plant community is dominated by Wyoming big sagebrush and Salmon wildrye under a sparse canopy of Utah juniper. Utah juniper canopy cover is less than 10 percent. Potential vegetative composition is about 45% grasses, 5% forbs and 50% shrubs and trees. Approximate ground cover (basal and crown) is 10 to 20 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	101	177	228
Shrub/Vine	101	177	228
Forb	11	19	25
Tree	11	19	25
Total	**224**	**392**	**506**

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	**Primary Perennial Grasses**			133–236	
	Salmon wildrye	LESAS2	*Leymus salinus ssp. salmonis*	118–196	–
	Sandberg bluegrass	POSE	*Poa secunda*	8–20	–
	squirreltail	ELEL5	*Elymus elymoides*	8–20	–
2	**Secondary Perennial Grasses**			8–20	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	2–12	–
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	2–12	–
	bluebunch wheatgrass	PSSPS	*Pseudoroegneria spicata ssp. spicata*	2–12	–
Forb					
3	**Perennial**			8–31	
	milkvetch	ASTRA	*Astragalus*	2–12	–
	buckwheat	ERIOG	*Eriogonum*	2–12	–
	skeletonplant	LYGOD	*Lygodesmia*	2–12	–
	spiny phlox	PHHO	*Phlox hoodii*	2–12	–
Shrub/Vine					
4	**Primary Shrubs**			126–177	
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	118–157	–
5	**Secondary Shrubs**			20–58	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	4–12	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	4–12	–
	jointfir	EPHED	*Ephedra*	4–12	–
	buckwheat	ERIOG	*Eriogonum*	4–12	–
	spiny hopsage	GRSP	*Grayia spinosa*	4–12	–
	purple sage	SADOI	*Salvia dorrii ssp. dorrii var. incana*	4–12	–
	littleleaf horsebrush	TEGL	*Tetradymia glabrata*	4–12	–

Tree					
6	**Evergreen**			8–31	
	Utah juniper	JUOS	*Juniperus osteosperma*	8–31	–

Animal community

Livestock Interpretations:
This site has limited value for livestock grazing due to steep slopes. Little information is available concerning livestock utilization of Salmon wildrye, though it is utilized by domestic sheep and presumably other grazing animals. Salmon wildrye provides a moderate amount of fair quality, coarse forage during the growing season, but is unpalatable when mature and dried. Palatability has been rated poor to good for sheep and fair to good for cattle and horses. Bottlebrush squirreltail is very palatable winter forage for domestic sheep of Intermountain ranges. Domestic sheep relish the green foliage. Overall, bottlebrush squirreltail is considered moderately palatable to livestock. Sandberg 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. Sandberg 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. Livestock browse Wyoming big sagebrush, but may use it only lightly when palatable herbaceous species are available. The palatability for common pricklygilia is poor for cattle and horses and poor to fair for sheep. Common pricklygilia is moderately grazed by sheep in early and late summer. Utah juniper is used by and livestock for cover and food.

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 Interpertations:
Utah juniper is used by many birds and wildlife for cover and food. The foliage is grazed by mule deer when other foliage is scarce and during periods of deep snow. Juniper "berries" or berry-cones are eaten by jackrabbits and coyotes. Many bird species depend on juniper berry-cones for fall and winter food. Wyoming big sagebrush is preferred browse for wild ungulates. Pronghorn usually browse Wyoming big sagebrush heavily. Sagebrush-grassland communities provide critical sage-grouse breeding and nesting habitats. Meadows surrounded by sagebrush may be used as feeding and strutting grounds. Sagebrush is a crucial component of their diet year-round, and sage-grouse select sagebrush almost exclusively for cover. Sage-grouse prefer mountain big sagebrush and Wyoming big sagebrush communities to basin big sagebrush communities. Common pricklygilia is used by bighorn sheep in December and by mule deer in February and April. Little information is available concerning wildlife utilization of Salmon wildrye. Salmon wildrye cover value has been rated poor to fair for mule deer, poor to good for

upland game birds, and fair to good for small nongame birds and small mammals. Bottlebrush squirreltail is a dietary component of several wildlife species. Sandberg 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.

Hydrological functions

Runoff is very high. Permeability is moderate. Hydrologic soil group is D.

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 hiking and has potential for upland and big game hunting.

Other products

Native Americans made tea from big sagebrush leaves. They used the tea as a tonic, an antiseptic, for treating colds, diarrhea, and sore eyes and as a rinse to ward off ticks. Big sagebrush seeds were eaten raw or made into meal.

Other information

Bottlebrush squirreltail is tolerant of disturbance and is a suitable species for revegetation. Wyoming big sagebrush is used for stabilizing slopes and gullies and for restoring degraded wildlife habitat, rangelands, mine spoils and other disturbed sites. It is particularly recommended on dry upland sites where other shrubs are difficult to establish.

Type locality

Location 1: Humboldt County, NV	
Township/Range/Section	T40N R31E S16
UTM zone	N
UTM northing	373544
UTM easting	4577987
Latitude	41° 20′ 36″
Longitude	118° 30′ 41″
General legal description	SW 1/4, About 2 miles northeast of the Jackson Creek Ranch, 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).

Great Basin Ecological Site Development Project: State and Transition Models for Major Land Resource Area 23, Nevada and portions of California (Online; https://naes.agnt.unr.edu/PMS/Pubs/2019-4060.pdf)

Contributors

RWA
T Stringham (UNR under contract with BLM)

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	05/21/2025
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:**

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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:**
