Ecological site R023XY078NV
ASHY CLAYPAN 10-14 P.Z.

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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 Ashy 10-14" PZ Lahontan Sagebrush on Ashy Soils 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/R023XY903NV This site is slightly more productive than the modal site, with production ranging from 700 to 1300 lb/ac, 1000 lb/ac in normal years. The dominant grasses are Thurber's needlegrass and bluebunch wheatgrass. The dominant shrub is still Lahontan and/or low sagebrush, and may have a component of antelope bitterbrush. This site is found at the lower elevation of the group's range, from 5800-7000 feet. This site has the same model as the modal site with 6 states.

Associated sites

R023XY007NV	**LOAMY 14-16 P.Z.**
R023XY014NV	**SHALLOW LOAM 14+ P.Z.**
R023XY079NV	**ASHY CLAYPAN (COOL) 10-14 P.Z.**

Similar sites

R023XY060NV	**COBBLY CLAYPAN 8-12 P.Z.** less productive site; many cobbles on surface
R023XY079NV	**ASHY CLAYPAN (COOL) 10-14 P.Z.** FEID dominant grass
R023XY044NV	**VERY COBBLY CLAYPAN** POSE dominant grass; less productive; extremely cobbly surface

R023XY017NV	**CLAYPAN 14-16 P.Z.** FEID-PSSPS codominant
R023XY014NV	**SHALLOW LOAM 14+ P.Z.** FEID dominant grass
R023XY021NV	**SCABLAND 10-14 P.Z.** POSE dominant grass; lower production
R023XY031NV	**CLAYPAN 10-14 P.Z.** less productive site
R023XY059NV	**GRAVELLY CLAYPAN 10-12 P.Z.** ACTH7 dominant grass; less production
R023XY008NV	**MOUNTAIN RIDGE** FEID dominant grass; much less productive site

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia arbuscula*
Herbaceous	(1) *Pseudoroegneria spicata ssp. spicata* (2) *Achnatherum thurberianum*

Physiographic features

This site occurs on summits and moderate sideslopes of hills, mountains, and plateaus and on inter-plateau basins. Slopes range from 4 to 30 percent, but slope gradients of 2 to 8 percent are most typical. Elevations are 5900 to 6400 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Plateau (3) Mountain
Elevation	1,800 – 1,950 m

Slope	0 – 30 %
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 43 to 47 degrees F. The average growing season is about 80 to 100 days.

Nevada's climate is predominantly arid, with large daily ranges of temperature, infrequent severe storms, heavy snowfall in the higher mountains, and great location variations with elevation. Three basic geographical factors largely influence Nevada's climate: continentality, latitude, and elevation. Continentality is the most important factor. The strong continental effect is expressed in the form of both dryness and large temperature variations. Nevada lies on the eastern, lee side of the Sierra Nevada Range, a massive mountain barrier that markedly influences the climate of the State. The prevailing winds are from the west, and as the warm moist air from the Pacific Ocean ascend the western slopes of the Sierra Range, the air cools, condensation occurs and most of the moisture falls as precipitation. As the air descends the eastern slope, it is warmed by compression, and very little precipitation occurs. The effects of this mountain barrier are felt not only in the West but throughout the state, with the result that the lowlands of Nevada are largely desert or steppes. The temperature regime is also affected by the blocking of the inland-moving maritime air. Nevada sheltered from maritime winds, has a continental climate with well-developed seasons and the terrain responds quickly to changes in solar heating.
Nevada lies within the mid-latitude belt of prevailing westerly winds which occur most of the year. These winds bring frequent changes in weather during the late fall, winter and spring months, when most of the precipitation occurs. To the south of the mid-latitude westerlies, lies a zone of high pressure in subtropical latitudes, with a center over the Pacific Ocean. In the summer, this high-pressure belt shifts northward over the latitudes of Nevada, blocking storms from the ocean. The resulting weather is mostly clear and dry during the summer and early fall, with scattered thundershowers. The eastern portion of the state receives significant summer thunderstorms generated from monsoonal moisture pushed up from the Gulf of California, known as the North American monsoon. The monsoon system peaks in August and by October the monsoon high over the Western U.S. begins to weaken and the precipitation retreats southward towards the tropics (NOAA 2004).

Average annual precipitation is 16 to over 20 inches. Mean annual air temperature is 41 to 44 degrees F. The average growing season is about 50 to 70 days.

Mean annual precipitaion at the Bear Creek, Nevada SNOTEL station (170501020301) is 37.69 inches.

monthly mean precipitation is:
January 3.84; February 3.75; March 4.38; April 4.9;
May 3.99; June 2.82; July .95; August 1.66;
September 1.22; October 2.12;
November 3.67; December 4.38.

Table 3 Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	
Precipitation total (average)	310 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are shallow to moderately deep and well drained. They are formed in residuum and colluvium derived from mixed parent matterials. Surface soils are medium to moderately coarse textured and are underlain by medium textured subsoils. Available water capacity is moderate. There are very high amounts of vitric volcanic ash and glass throughout the soil profile which enhances the water holding capacity of these soils. Infiltration is rapid and permeability is moderately slow. Runoff is medium and the potential for sheet and rill erosion is moderate to high depending on slope. The soils have a mollic epipedon. The soil series associated with this site include: Ashone.

Table 4. Representative soil features

Surface texture	(1) Very gravelly fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow
Soil depth	50 – 100 cm
Surface fragment cover <=3"	40 – 50 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	10.16 – 10.41 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)	6.6 – 7.8
Subsurface fragment volume <=3" (Depth not specified)	20 – 50 %

Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

Where management results in abusive grazing use by livestock and/or feral horses, low sagebrush, balsamroot and bluegrasses increase as bluebunch wheatgrass and Thurber's needlegrass decrease. Although western juniper is recognized as occurring on this site, tree canopy cover is less than 10% in the historic climax plant community. Cheatgrass will readily invade this site.

Fire Ecology:
Prior to 1897, mean fire return intervals for low sagebrush communities have been estimated to be from 35 to over 100 years. Fire most often occurs during wet years with high forage production. Low sagebrush is very susceptible to fire damage. Low sagebrush is usually killed by fire and does not re-sprout. The recovery in burned areas is usually via small, light, wind-dispersed seed for all low sagebrush subspecies. Partially injured low sagebrush may re-grow from living branches, but sprouting does not occur. Antelope bitterbrush is considered a weak sprouter and is often killed by summer or fall fire. Antelope bitterbrush in some areas may sprout after light-severity spring fire. High fuel consumptions increase antelope bitterbrush mortality and therefore favors seedling establishment. Thurber’s needlegrass is classified as moderately resistant, but depending on season of burn, phenology, and fire severity, this perennial bunchgrass is moderately to severely damaged by fire. Early season burning is more damaging to this needlegrass than late season burning. Burning bluebunch wheatgrass may remove most of the aboveground biomass but does not usually result in plant mortality. Bluebunch wheatgrass is generally favored by burning. Burning stimulates flowering and seed production. However, season of burning affects mortality. Nevada and Canby’s bluegrass are generally unharmed by fire. They produces little litter, and its small bunch size and sparse litter reduces the amount of heat transferred to perennating buds in the soil. Their rapid maturation in the spring also reduces fire damage, since they are dormant when most fires occur. Idaho fescue grows in a dense, fine-leaved tuft. Fires tend to burn within the accumulated fine leaves at the base of the plant and may produce temperatures sufficient to kill some of the root crown. Mature Idaho fescue plants are commonly reported to be severely damaged by fire in all seasons.

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 (%)
Grass/Grasslike					
1	**Primary Perennial Grasses**			527-1065	
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	224-448	–
	bluebunch wheatgrass	PSSPS	*Pseudoroegneria spicata ssp. spicata*	224-448	–
	Idaho fescue	FEID	*Festuca idahoensis*	22-56	–
2	**Secondary Perennial Grasses**			22-90	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	6-34	–
	western needlegrass	ACOCO	*Achnatherum occidentale ssp. occidentale*	6-34	–
	squirreltail	ELEL5	*Elymus elymoides*	6-34	–
	big squirreltail	ELMU3	*Elymus multisetus*	6-34	–
	needle and thread	HECO26	*Hesperostipa comata*	6-34	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	6-34	–
	Sandberg bluegrass	POSE	*Poa secunda*	6-34	–
Forb					
3	**Perennial**			56-168	
	aster	ASTER	*Aster*	6-34	–
	milkvetch	ASTRA	*Astragalus*	6-34	–
	arrowleaf balsamroot	BASA3	*Balsamorhiza sagittata*	6-34	–

	tapertip hawksbeard	CRAC2	*Crepis acuminata*	6-34	–
	fleabane	ERIGE2	*Erigeron*	6-34	–
	buckwheat	ERIOG	*Eriogonum*	6-34	–
	lupine	LUPIN	*Lupinus*	6-34	–
Shrub/Vine					
4	**Primary Shrubs**			191-392	
	little sagebrush	ARAR8	*Artemisia arbuscula*	168-280	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	22-112	–
5	**Secondary Shrubs**			22-112	
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	11-34	–
	currant	RIBES	*Ribes*	11-34	–
Tree					
6	**Evergreen**			6-22	
	western juniper	JUOC	*Juniperus occidentalis*	6-22	–

Animal community

Livestock Interpretations: This site is suitable for livestock grazing. Grazing management should be keyed to perennial grass production. Thurber's needlegrass species begin growth early in the year and remain green throughout a relatively long growing season. This pattern of development enables animals to use Thurber's needlegrass when many other grasses are unavailable. Cattle prefer Thurber's needlegrass in early spring before fruits have developed as it becomes less palatable when mature. Thurber's needlegrasses are grazed in the fall only if the fruits are softened by rain. Bluebunch wheatgrass is considered one of the most important forage grass species on western rangelands for livestock. Although bluebunch wheatgrass can be a crucial source of forage, it is not necessarily the most highly preferred species. Nevada and Canby's bluegrass are widespread forage grasses. They are of the earliest grasses in the spring and are sought by domestic livestock and several wildlife species. Nevada and Canby's bluegrass are palatable species, but their production is closely tied to weather conditions. They produces little forage in drought years, making them a less dependable food source than other perennial bunchgrasses. Idaho fescue provides important forage for many types of domestic livestock. The foliage cures well and is preferred by livestock in late fall and winter. Domestic sheep and to a much lesser degree cattle consume low sagebrush, particularly during the spring, fall and winter. Antelope bitterbrush is important browse for livestock. Domestic livestock and mule deer may compete for antelope bitterbrush in late summer, fall, and/or winter. Cattle prefer antelope bitterbrush from mid-May through June and again in September and October. 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: Low sagebrush is considered a valuable browse plant during the spring, fall and winter months. In some areas it is of little value in winter due to heavy snow. Mule deer utilize and sometimes prefer low sagebrush, particularly in winter and early spring. 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. Pronghorn antelope, mule deer, elk, and bighorn sheep utilize antelope bitterbrush extensively. Mule deer use of antelope bitterbrush peaks in September, when antelope bitterbrush may compose 91 percent of the diet. Winter use is greatest during periods of deep snow. Antelope bitterbrush seed is a large part of the diets of rodents, especially deer mice and kangaroo rats. Thurber needlegrass is valuable forage for wildlife. Bluebunch wheatgrass is considered one of the most important forage grass species on western rangelands for wildlife. Bluebunch wheatgrass does not generally provide sufficient cover for ungulates, however, mule deer are frequently found in bluebunch-dominated grasslands. Nevada and Canby's bluegrass are 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. Idaho fescue provides important forge for several wildlife species. It is reported to be good forage for pronghorn, and deer in ranges of northern Nevada.

Hydrological functions

Runoff is medium. Permeability is moderately slow. Hydrologic soil group is C.

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 camping and hiking and has potential for upland and big game hunting.

Other information

Low sagebrush can be successfully transplanted or seeded in restoration. Antelope bitterbrush has been used extensively in land reclamation. Antelope bitterbrush enhances succession by retaining soil and depositing organic material and in some habitats and with some ecotypes, by fixing nitrogen.

Type locality

Location 1: Washoe County, NV	
Township/Range/Section	T42N R19E S5
UTM zone	N
UTM northing	260026
UTM easting	4608254
Latitude	41° 35′23″
Longitude	119° 52′44″
General legal description	SW 1/4 NE 1/4, Approximately 1 mile west of Vya, and about ¼ mile south of the north fork of County Road 34, Washoe County, Nevada. This site also occurs in 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).

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	11/01/2026
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):**

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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:**
