

Ecological site R027XY054NV

LOAMY SLOPE 10-12 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.

MLRA notes

Major Land Resource Area (MLRA): 027X–Fallon-Lovelock Area

Physiography Found in the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus this area is characterized by isolated uplifted fault block mountain ranges trending north to south that are separated by broad, hydrologically closed basins. The entire area occurs in the rain-shadow of the Sierra Nevada mountains and is influenced by Pleistocene Lake Lahontan which reached its most recent high stand about 12,000 years ago. There is substantial evidence suggesting the western Great Basin has been the site of pluvial-interpluvial cycles for at least the past two million years. The mountains and valleys are dissected by the Humboldt, Truckee, Carson, and Walker Rivers and their tributaries, all of which terminate within MLRA 27. Extensive playas can be found throughout this area and are the result of drying of ancient Lake Lahontan. Elevation generally ranges from 3,300 to 5,900 feet (1,005 to 1,800 meters) in valleys, but on some mountain peaks it is more than 7,870 feet (2,400 meters). Geology Landforms and soils of this MLRA have been heavily influenced by fluctuating lake level over the last 40,000 years. There is a level line evident on the higher slopes marking the former extent of glacial Lake Lahontan. Almost half of this area has surface deposits of alluvial valley fill influenced by lacustrine sediment. The rest has andesite and basalt rocks of different ages. Mesozoic and Tertiary intrusives are concentrated along the western border of the area, and Lower Volcanic Rocks (17 to 43 million years old) are common on the eastern side of the area. Also, some scattered outcrops of Mesozoic sedimentary and volcanic rocks and tuffaceous sedimentary rocks are in the mountains within the interior of this MLRA. Climate The average annual precipitation is 5 to 10 inches (125 to 255 millimeters) in most of the area but is as much as 19 inches (485 millimeters) on high mountain slopes. Most of the rainfall occurs as high-intensity, convective thunderstorms during the growing season. The amount of precipitation is very low from summer to midautumn. The precipitation in winter occurs mainly as snow. The average annual temperature is 43 to 54 degrees F (6 to 12 degrees C). The freeze-free period averages 155 days and ranges from 110 to 195 days, decreasing in length with elevation. Water The amount of precipitation is very low, and water for irrigation is obtained principally from diversions on the four large rivers in the area and from water stored in the Lahontan, Rye Patch, and Weber Reservoirs. Pyramid Lake and Walker Lakes are terminal lakes for the Truckee and Walker Rivers, respectively. Much of the annual flow of both rivers is diverted for irrigation, causing lake levels to fall and levels of dissolved salts to increase causing problems for the native Lahontan cutthroat trout. Soils The dominant soil orders are Aridisols and Entisols. The soils in the area are predominantly a mesic temperature regime, aridic moisture regime, and have a mixed mineralogy. They are generally well drained, loamy or sandy, commonly skeletal, and shallow to very deep. Accumulation of salts, tufa deposits, and eolian sediments with soluble salts over lacustrine deposits influence most of the soils in the basin landforms of this MLRA. Soils on bedrock-controlled landforms are typically comprised of volcanic or tuffaceous sedimentary colluvium over residuum. Biological Resources This area supports extensive areas of salt-desert shrub vegetation. Shadscale and Bailey's greasewood are widespread, occurring both individually and together. Grasses are generally sparse, although Indian ricegrass is prominent, especially on the sandy soils. Fourwing saltbush, winterfat, spiny hopsage, wolfberry, ephedra, dalea, and bud sagebrush are common shrubs. Basin wildrye, creeping wildrye, alkali sacaton, saltgrass, black greasewood, rubber rabbitbrush, and big saltbush are important plants on saline bottom lands and terraces. A few marsh areas support cattail, bulrushes, sedges, and rushes. Big sagebrush, along with scattered Utah juniper and singleleaf pinyon, is associated with Thurber needlegrass, desert needlegrass, Sandberg bluegrass, and squirreltail on the higher elevation piedmont slopes and mountains.

Ecological site concept

The Loamy Slope 10-12 P.Z. site occurs on mountains and plateaus on all aspects. Slope gradients of 15 to 50 percent are typical. Elevations are 4000 to 6300 feet. The soils are moderately deep and are well drained.

Associated sites

R027XY058NV	LOAMY 10-12 P.Z. More productive site; gentler slopes
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Similar sites

R027XY073NV	GRANITIC SLOPE 12-14 P.Z. More productive site; granitic PM
R027XY072NV	GRANITIC SLOPE 10-12 P.Z. More productive site; granitic PM
R027XY007NV	LOAMY SLOPE 8-10 P.Z. Less productive site; ACHY major grass

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata ssp. wyomingensis</i> (2) <i>Artemisia tridentata ssp. vaseyana</i>
Herbaceous	(1) <i>Achnatherum thurberianum</i>

Physiographic features

The Loamy Slope 10-12 P.Z. site occurs on mountains and plateaus on all aspects. Slope gradients of 15 to 50 percent are typical. Elevations are 4000 to 6300 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Plateau
Runoff class	Very high
Elevation	1,220 – 1,920 m
Slope	20 – 50 %
Water table depth	180 cm

Aspect	Aspect is not a significant factor
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Climatic features

The climate is semiarid with cool, moist winters and warm, dry summers. Average annual precipitation is 10 to 12 inches. Mean annual temperatures are 42 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)	310 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are moderately deep and are well drained. Available water capacity is low. Permeability is moderately slow and surface runoff is very high. Potential for sheet and rill erosion is high. The soil series associated with this site include: Indiano.

Table 4. Representative soil features

Parent material	(1) Colluvium (2) Residuum
Surface texture	(1) Gravelly sandy loam (2) Very stony loam (3) Very gravelly clay loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow
Soil depth	50 – 100 cm
Surface fragment cover <=3"	20 %

Surface fragment cover >3"	10 %
Available water capacity (0-101.6cm)	4.83 – 12.7 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)	6.1 – 7.3
Subsurface fragment volume <=3" (Depth not specified)	20 %
Subsurface fragment volume >3" (Depth not specified)	10 %

Ecological dynamics

Where management results in abusive grazing use by livestock or feral horses, Thurber's needlegrass composition declines and is replaced by bluegrasses and bottlebrush squirreltail as the dominant understory grasses. Cheatgrass and other annuals will often dominate the understory as big sagebrush and Douglas' rabbitbrush increase in the overstory with degraded ecological condition. Where site degradation has been fire-induced, broom snakeweed, horsebrush, and rabbitbrush often dominate the site. In the absence of periodic, natural, wildfire, singleleaf pinyon and Utah juniper commonly encroach onto this site.

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.

Mountain big sagebrush is highly susceptible to injury from fire. It is often top-killed by fire and will not resprout.

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.

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			251-377	
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	235-314	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	16-63	–
2	Secondary Perennial Grasses			16-63	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	3-24	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	3-24	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	3-24	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	3-24	–
Forb					
3	Perennial Forbs			39-118	
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	3-24	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	3-24	–
	buckwheat	ERIOG	<i>Eriogonum</i>	3-24	–
	lupine	LUPIN	<i>Lupinus</i>	3-24	–
	phlox	PHLOX	<i>Phlox</i>	3-24	–
Shrub/Vine					
4	Primary Shrubs			157-235	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	78-118	–
5	Secondary Shrubs			9-71	
	Utah serviceberry	AMUT	<i>Amelanchier utahensis</i>	3-24	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	3-24	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	3-24	–
	desert peach	PRAN2	<i>Prunus andersonii</i>	3-24	–
Tree					
6	Evergreen			7-47	
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	3-24	–
	singleleaf pinyon	PIMO	<i>Pinus monophylla</i>	3-24	–

Animal community

Livestock Interpretations: This site is suitable to livestock grazing. Grazing management should be keyed to Thurber's needlegrass 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. Livestock browse Wyoming big sagebrush, but may use it only lightly when palatable herbaceous species are available. Mountain big sagebrush is eaten by domestic livestock but has long been considered to be of low palatability, and a competitor to more desirable species. 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: Thurber needlegrass is valuable forage for wildlife. Wyoming big sagebrush is preferred browse for wild ungulates. Pronghorn usually browse Wyoming big sagebrush heavily. Mountain big sagebrush is highly preferred and nutritious winter forage for mule deer.

Hydrological functions

Runoff is very high. Permeability is moderately slow.

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 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. Native Americans used big sagebrush leaves and branches for medicinal teas, and the leaves as a fumigant. Bark was woven into mats, bags and clothing.

Other information

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.

Inventory data references

NASIS soil component data.

Type locality

Location 1: Churchill County, NV	
Township/Range/Section	T18N R37E S21
General legal description	Off US Hwy 50 near Cold Creek HMS, Edwards Creek Valley, Churchill County, Nevada.
Location 2: Pershing County, NV	
Township/Range/Section	T31N R37E S31
General legal description	Klondike Pass area, East Humboldt Range, Pershing 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

GKB

Approval

Kendra Moseley, 6/03/2024

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	09/22/2026
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:
