

Ecological site R027XY051NV

SOUTH SLOPE 8-10 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 South Slope 8-10 P.Z. site occurs on hills and mountains on all aspects. Slope gradients of 15 to 50 percent are typical. Elevations are 4400 to 7200 feet. The soils are very shallow to moderately deep and are well drained.

Associated sites

R027XY007NV	LOAMY SLOPE 8-10 P.Z. GRSP-TEGL-EPNE dominant shrubs
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Similar sites

R027XY067NV	GRANITIC LOAM 8-10 P.Z. ACSP12 dominant plant; more productive site; gentler slopes
R027XY007NV	LOAMY SLOPE 8-10 P.Z. ACTH7 dominant grass; more productive site
R027XY065NV	GRANITIC SLOPE 8-10 P.Z. ACSP12 dominant plant; more productive site

Table 1. Dominant plant species

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

Physiographic features

The South Slope 8-10 P.Z. site occurs on hills and mountains on all aspects. Slope gradients of 15 to 50 percent are most typical. Elevations are 4400 to 7200 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain
Runoff class	High to very high
Elevation	1,340 – 2,200 m
Slope	20 – 50 %
Water table depth	180 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate is semiarid with cool, moist winters and warm, dry summers. Average annual precipitation is 8 to 10 inches. Mean annual temperatures are 48 to 55 degrees F. The average growing season is about 90 to 120 days.

Table 3 Representative climatic features

Frost-free period (average)	120 days
Freeze-free period (average)	
Precipitation total (average)	250 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are very shallow to moderately deep and are well drained. Available water capacity is very low. Permeability is moderately slow to moderate and surface runoff is high to very high. Potential for sheet and rill erosion is moderate to high. The soil series associated with this site include: Bombadil, Colvar, Nicanor, and Old Camp.

Table 4. Representative soil features

Parent material	(1) Colluvium – volcanic rock (2) Residuum – volcanic rock
Surface texture	(1) Stony loam (2) Very cobbly loam (3) Very stony loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow to moderate
Soil depth	10 – 100 cm
Surface fragment cover <=3"	10 – 20 %
Surface fragment cover >3"	0 – 20 %

Available water capacity (0-101.6cm)	2.03 – 7.11 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	6.6 – 10
Subsurface fragment volume <=3" (Depth not specified)	10 – 20 %
Subsurface fragment volume >3" (Depth not specified)	0 – 30 %

Ecological dynamics

As ecological condition declines, overstory shrubs such as Wyoming big sagebrush, littleleaf horsebrush, and Douglas' rabbitbrush increase as Sandberg's bluegrass and bottlebrush squirreltail increase in the understory. After wildfire, Douglas' rabbitbrush, littleleaf horsebrush, spiny hopsage and Nevada ephedra often dominate the aspect. If excessive erosion occurs following disturbance such as wildfire, the potential plant community may permanently be altered to that characterized by the Eroded Granitic Slope (027XY047NV) ecological site. Species likely to invade this site are annuals such as cheatgrass and filaree.

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.

Desert needlegrass has persistent dead leaf bases, which make it susceptible to burning. Fire removes the accumulation; a rapid, cool fire will not burn deep into the root crown. Most perennial grasses have root crowns that can survive wildfire.

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 (%)
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Grass/Grasslike					
1	Primary Perennial Grasses			100-197	
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	59-99	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	20-59	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	20-39	–
2	Secondary Perennial Grasses			8-43	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	2-12	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	2-12	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	2-12	–
Forb					
3	Perennial Forbs			8-43	
	buckwheat	ERIOG	<i>Eriogonum</i>	2-8	–
	phlox	PHLOX	<i>Phlox</i>	2-8	–
Shrub/Vine					
4	Primary Shrubs			139-216	
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	20-39	–
	purple sage	SADOI	<i>Salvia dorrii ssp. dorrii var. incana</i>	20-39	–
5	Secondary Shrubs			20-39	
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	2-12	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	2-12	–
	buckwheat	ERIOG	<i>Eriogonum</i>	2-12	–
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	2-12	–
	littleleaf horsebrush	TEGL	<i>Tetradymia glabrata</i>	2-12	–

Animal community

Livestock Interpretations: Due to its southerly exposure, this site loses its snow cover earlier in the spring and plant growth is initiated before that of most adjacent sites. Thus, livestock may concentrate on this site during early spring grazing periods. Grazing management should be keyed to desert needlegrass production. Young desert needlegrass is palatable to all classes of livestock. Mature herbage is moderately grazed by horses and cattle, but rarely grazed by sheep. Livestock browse Wyoming big sagebrush, but may use it only lightly when palatable herbaceous species are available. 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: Young desert needlegrass is palatable to many species of wildlife. Desert needlegrass produces considerable basal foliage and is good forage while young. Desert bighorn sheep graze desert needlegrass. 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.

Hydrological functions

Runoff is high to very high. Permeability is moderately slow to moderate.

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

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	T14N R32E S20
General legal description	About 3 miles north of Rawhide (site), Sand Springs Range, Churchill County, Nevada. This site also occurs in Lyon, Mineral, Pershing and Storey Counties, 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

DK/GD

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)	P NOVAK-ECHENIQUE
Contact for lead author	State Rangeland Management Specialist
Date	07/12/2012
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills are none to rare. A few can occur on steeper slopes and most frequently occur in areas subjected to summer convection storms or rapid spring snowmelt.

2. **Presence of water flow patterns:** Waterflow patterns are none to rare. A few will occur in areas subjected to summer convection storms or rapid spring snowmelt.

3. **Number and height of erosional pedestals or terracettes:** Pedestals are none to rare and most frequently occur in areas subjected to summer convection storms or rapid spring snowmelt.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground $\pm$ 50-60% depending on amount of surface rock fragments.

5. **Number of gullies and erosion associated with gullies:** None

6. **Extent of wind scoured, blowouts and/or depositional areas:** None to slight deposition at base of shrubs on steeper slopes.

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter (foliage from grasses and annual & perennial forbs) expected to move distance of slope length (<10 ft) during intense summer storms. Persistent litter (large woody material) will remain in place except during large rainfall events.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil stability values should be 4 to 6 on the coarse surface soil textures found on this site.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is moderate tin to weak medium platy. Soil surface colors are light and soils are typified by an ochric epipedon. Organic matter of the surface 2 to 3 inches is typically less than 1.5 percent dropping off quickly below. Organic matter content can be more or less depending on micro-topography.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial herbaceous plants (especially deep-rooted bunchgrasses [i.e., desert needlegrass, Indian ricegrass] slow runoff and increase infiltration. Shrub canopy and associated litter break raindrop impact and provide opportunity for snow catch and accumulation on site.

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): None
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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: Deep-rooted, cool season, perennial bunchgrasses >> Wyoming big sagebrush > associated shrubs

Sub-dominant: shallow-rooted, cool-season perennial bunchgrasses > perennial forbs = annual forbs

Other: After wildfires, perennial bunchgrasses and sprouting shrubs (ephedra, rabbitbrush, horsebrush) will dominate. Big sagebrush will be removed for several years.

Additional:

13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): Dead branches within individual shrubs common and standing dead shrub canopy material may be as much as 30% of total woody canopy; some of the mature bunchgrasses (to 25%) have dead centers.
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14. Average percent litter cover (%) and depth (in): Under canopy and between plant interspaces 15-25%; depth < ¼ in
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15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production): For normal or average growing season $\pm$ 350 lbs/ac; Favorable years $\pm$ 500 lbs/ac and unfavorable years $\pm$ 200 lbs/ac,
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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: Cheatgrass, annual mustards, and red-stem filaree are potential invaders on this site.
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17. Perennial plant reproductive capability: All functional groups should reproduce in average (or normal) and above average growing season years. Reduced growth and reproduction occur during extreme or extended drought periods.
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