

Ecological site R027XY067NV GRANITIC LOAM 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 Granitic Loam 8-10 P.Z. site occurs on inset fans and alluvial fans on all aspects. Slope gradients of 2 to 15 percent are typical. Elevations are 4500 to 6400 feet. The soils are very deep and somewhat excessively drained. These soils have formed in alluvium from granitic rock parent material with volcanic ash influence throughout. The soil surface is coarse in texture and typically gravelly.

Associated sites

R027XY065NV	GRANITIC SLOPE 8-10 P.Z. Less productive site; steep slopes; soils typically shallow or very shallow
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Similar sites

R027XY051NV	SOUTH SLOPE 8-10 P.Z. Less productive site; SADOCl important shrub
R027XY054NV	LOAMY SLOPE 10-12 P.Z. ACTH7 dominant grass
R027XY047NV	ERODED GRANITIC SLOPE GRSP-TEGL-EPNE codominant shrubs
R027XY072NV	GRANITIC SLOPE 10-12 P.Z. ACTH7 dominant grass
R027XY088NV	GRANITIC LOAM 10-12 P.Z. ACTH7 dominant grass
R027XY007NV	LOAMY SLOPE 8-10 P.Z. ACTH7 dominant grass

Table 1. Dominant plant species

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

Physiographic features

The Granitic Loam 8-10 P.Z. site occurs on inset fans and alluvial fans on all aspects. Slope gradients of 2 to 15 percent are typical. Elevations are 4500 to 6400 feet.

Table 2. Representative physiographic features

Landforms	(1) Inset fan (2) Alluvial fan
Runoff class	Low
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Rare
Ponding frequency	None
Elevation	4,500–6,400 ft
Slope	2–15%
Water table depth	72 in
Aspect	Aspect is not a significant factor

Climatic features

The climate is semiarid with warm, dry summers and cool, moist winters. Average annual precipitation is 8 to 10 inches. Mean annual temperatures are 45 to 55 degrees F. The average growing season is about 90 to 120 days. There is no climate station available for this site.

Table 3. Representative climatic features

Frost-free period (average)	120 days
Freeze-free period (average)	
Precipitation total (average)	10 in

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are very deep and somewhat excessively drained. These soils have formed in alluvium from granitic rock parent material with volcanic ash influence throughout. The soil surface is coarse in texture and typically gravelly. Permeability and infiltration are moderately rapid and runoff is low. Sheet and rill erosion potential is slight. The soil series associated with this site include: Cresal and Wiskiflat.

Table 4. Representative soil features

Parent material	(1) Alluvium–granite (2) Alluvium–granite (3) Alluvium–granite
Surface texture	(1) Gravelly loamy sand (2) Very gravelly coarse sand (3) Very gravelly sandy loam
Family particle size	(1) Loamy
Drainage class	Somewhat excessively drained
Permeability class	Moderately rapid
Soil depth	72–84 in
Surface fragment cover ≤3"	22–34%
Surface fragment cover >3"	1–4%
Available water capacity (0–40in)	2–2.1 in

Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	6.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	22–34%
Subsurface fragment volume >3" (Depth not specified)	1–4%

Ecological dynamics

As ecological condition declines, overstory shrubs such as Wyoming big sagebrush, littleleaf horsebrush, and Douglas' rabbitbrush increase as Sandberg's bluegrass and galleta increase in the understory. With further site degradation galleta and bluegrass also decline. After wildfire, Douglas' rabbitbrush, littleleaf horsebrush, wolfberry, spiny hopsage and Nevada ephedra often dominate the aspect. 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.

Spiny hopsage is considered to be somewhat fire tolerant and often survives fires that kill sagebrush. Mature spiny hopsage generally sprout after being burned. Spiny hopsage is reported to be least susceptible to fire during summer dormancy.

Nevada ephedra generally sprouts after fire damages aboveground vegetation. Underground regenerative structures commonly survive when aboveground vegetation is consumed by fire. However, severe fires may kill shallowly buried regenerative structures.

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.

Indian ricegrass can be killed by fire, depending on severity and season of burn. Indian ricegrass reestablishes on burned sites through seed dispersed from adjacent unburned areas.

State and transition model

1: Reference State

Community Phase 1.1

Desert needlegrass dominant, Wyoming big sagebrush sub-dominant.
Spiny hopsage & Nevada ephedra common. Other species include; Indian ricegrass, winterfat, galleta and forbs

Community Phase 1.2

Wyoming big sagebrush decreases
Sprouting shrubs temporarily increase
Perennial bunchgrasses and native forbs increase

Community Phase 1.3

Wyoming big sagebrush and other shrubs increase
Perennial herbaceous understory is reduced

T1A

State 2

Community Phase 2.1

Desert needlegrass dominant, Wyoming big sagebrush sub-dominant.
Spiny hopsage & Nevada ephedra common. Other species include; Indian ricegrass, winterfat, galleta and forbs
Annual non-native species present

Community Phase 2.2

Wyoming big sagebrush decreases
Perennial bunchgrasses increase
Sprouting shrubs stable to increasing
Annual non-native species stable to increasing

Community Phase 2.3 (At Risk)

Wyoming big sagebrush increases. Shallow rooted bunchgrass like bluegrass and squirreltail increase
Deep-rooted perennial bunchgrass decrease
Annual non-native species stable to increasing

T2A

R3A

T2B

State 3

Community Phase 3.1

Decadent Wyoming big sagebrush and rabbitbrush dominate overstory
Desert needlegrass & Indian ricegrass decrease. Bluegrass can be present or dominant.
Annual non-native species increase
Bare ground increasing

Community Phase 3.2

Shallow rooted bunchgrass dominate site
Annual non-native species may be present to increasing, but are not dominant.
Trace amounts of sagebrush, rabbitbrush, spiny hopsage and/or ephedra may be present

State 4

Community Phase 4.1

Annual non-natives, cheatgrass tansy mustard, etc., dominate site

Community Phase 4.2

Broom snakeweed, rabbitbrush, spiny hopsage, and/or Wyoming sagebrush dominate overstory
Annual non-natives dominate understory
Bare ground increasing

T3A

Reference State 1.0: The Reference State 1.0 is a representative of the natural range of variability under pristine conditions. State dynamics are maintained by interactions between climatic patterns and disturbance regimes. Negative feedbacks enhance ecosystem resilience and contribute to the stability of the state. These include the presence of all structural and functional groups, low fine fuel loads, and retention of organic matter and nutrients. Plant community phase changes are primarily driven by fire, periodic drought and/or insect or disease attack.

Community Phase 1.1:

Wyoming big sagebrush and desert needlegrass dominate the site. Indian ricegrass, spiny hopsage and Nevada ephedra are also common. Forbs are present but not abundant. This site is tolerant of dry conditions, but prolonged drought will result in an overall decline, with possible mortality, in the plant community.

Community Phase Pathway 1.1a: Fire would decrease or eliminate the overstory of sagebrush and allow the perennial bunchgrasses to dominate the site. Under natural conditions fires are typically small and patchy due to low fuel loads. A fire following an unusually wet spring or a change in management may be more severe and reduce sagebrush cover to trace amounts. A severe infestation of Aroga moth could also reduce large areas of sagebrush canopy cover, giving a competitive advantage to the perennial grasses and forbs.

Community Phase Pathway 1.1b: Time and lack of disturbance such as fire allows for sagebrush to increase and become decadent. Long-term drought, herbivory, or combinations of these would cause a decline in perennial bunchgrasses and fine fuels and lead to a reduced fire frequency allowing big sagebrush to dominate the site.

Community Phase 1.2: This community phase is characteristic of a post-disturbance, early seral community phase. Desert needlegrass, Indian ricegrass and other perennial grasses dominate. Depending on fire severity or intensity of Aroga moth infestation, patches of intact sagebrush may remain.

Community Phase Pathway 1.2a: Absence of disturbance over time coupled with natural regeneration allows sagebrush to increase. Patches of mature sagebrush required for a seed source are important for recovery to community phase 1.1.

Community Phase 1.3:

Wyoming big sagebrush increases in the absence of disturbance. Decadent sagebrush dominates the overstory and the deep-rooted perennial bunchgrasses in the understory are reduced either from competition with shrubs and/or from herbivory.

Community Phase 1.3a: Fire would decrease or eliminate the overstory of sagebrush and allow the perennial bunchgrasses to dominate the site. Fires would typically be low severity resulting in a mosaic pattern due to low fine fuel loads. A severe infestation of Aroga moth could also cause a large decrease in sagebrush within the community, giving a competitive advantage to the perennial grasses and forbs.

Community Phase Pathway 1.3b: A low severity patchy fire, Aroga moth or combination would reduce the sagebrush overstory and create a sagebrush/grass mosaic with sagebrush and deep-rooted perennial bunchgrasses co-dominant.

T1A: Transition from Reference State 1.0 to Current Potential State 2.0

Trigger: This transition is caused by the introduction of non-native annual weeds, such as cheatgrass, mustards, bur buttercup and halogeton.

Slow variables: Over time the annual non-native plants will increase within the community.

Threshold: Any amount of introduced non-native species causes an immediate decrease in the resilience of the site. Annual non-native species cannot be easily removed from the system and have the potential to significantly alter disturbance regimes from their historic range of variation.

Current Potential State 2.0:

This state is similar to the Reference State 1.0. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of non-natives. Non-natives may increase in abundance but will not become dominant within this State. These non-natives can be highly flammable and can promote fire where historically fire had been infrequent. Negative feedbacks enhance ecosystem resilience and contribute to the stability of the state. These feedbacks include the presence of all structural and functional groups, low fine fuel loads and retention of organic matter and nutrients. Positive feedbacks decrease ecosystem resilience and stability of the state. These include the non-natives' high seed output, persistent seed bank, rapid growth rate, ability to cross pollinate and adaptations for seed dispersal.

Community Phase 2.1: Wyoming big sagebrush and desert needlegrass dominate. Indian ricegrass, spiny hopsage and Nevada ephedra may be significant components while galleta and forbs make up smaller components. Annual weeds of the understory. Non-native annual species are present but not dominant.

percentages by weight of the understory. Non-native annual species are present, but not dominant.

Community Phase Pathway 2.1a: Fire reduces the shrub overstory and allows for perennial bunchgrasses to dominate the site. Fires are typically low severity resulting in a mosaic pattern due to low fuel loads. A fire following an unusually wet spring or a change in management favoring an increase in fine fuels, may be more severe and reduce sagebrush cover to trace amounts. A severe infestation of Aroga moth could also cause a large decrease in sagebrush cover, reducing competition with perennial grasses and forbs. Annual non-native species are likely to increase after fire.

Community Phase Pathway 2.1b: Natural regeneration over time and lack of disturbance such as fire allows for sagebrush to increase and become decadent. Chronic drought reduces fine fuels and leads to a reduced fire frequency allowing Wyoming big sagebrush to dominate the site. Inappropriate grazing management reduces the perennial bunchgrass understory; conversely Sandberg bluegrass may increase in the understory depending on grazing management. Excessive sheep grazing favors Sandberg bluegrass; however, where cattle and/or horses are the dominant grazers, cheatgrass often increases.

Community Phase 2.2: This community phase is characteristic of a post-disturbance, early seral community phase. Desert needlegrass and other perennial grasses dominate. Wyoming big sagebrush is present in trace amounts. Depending on fire severity or intensity of Aroga moth infestations, patches of intact sagebrush may remain. Rabbitbrush may be sprouting. Forbs may increase post-fire but will likely return to pre-burn levels within a few years. Annual non-native species generally respond well after fire and may be stable or increasing within the community.

Community Phase Pathway 2.2a: Natural regeneration over time and lack of disturbance and/or grazing management that favors the establishment and growth of sagebrush allows the shrub component to recover. The establishment of Wyoming big sagebrush can take many years and is dependent on multiple years of favorable weather conditions.

Community Phase 2.3 (at risk): This community is at risk of crossing a threshold to another state. Sagebrush dominates the overstory and perennial bunchgrasses in the understory are reduced, either from competition with shrubs or from inappropriate grazing management, or from both. Rabbitbrush and/or spiny hopsage may be a significant component. Sandberg bluegrass may increase and become co-dominate with deep rooted bunchgrasses. Annual non-natives species may be stable or increasing due to lack of competition with perennial bunchgrasses. This site is susceptible to further degradation from excessive grazing, prolonged drought, and/or fire.

Community Phase Pathway 2.3a: A change in grazing management that decreases shrubs would allow the perennial bunchgrasses in the understory to increase. Heavy late-fall/winter grazing may cause mechanical damage and subsequent death to sagebrush, facilitating an increase in the herbaceous understory. An infestation of Aroga moth or a low severity fire would reduce some sagebrush overstory and allow perennial grasses to increase in the community. Brush management with minimal soil disturbance would also decrease sagebrush and release the perennial understory. Annual non-native species are present and may increase in the community.

Community Phase Pathway 2.3b: Fire would decrease or eliminate the overstory of sagebrush and allow the perennial bunchgrasses to dominate the site. Fires would typically be small and patchy due to low fuel loads. A fire following an unusually wet spring or a change in management may be more severe and reduce sagebrush cover to trace amounts. A severe infestation of Aroga moth could also cause a large decrease in sagebrush within the community, giving a competitive advantage to the perennial grasses and forbs.

T2A: Transition from Current Potential State 2.0 to Shrub State 3.0

Trigger: Inappropriate, long-term grazing of perennial bunchgrasses during the growing season favors an increase in sagebrush.

Slow variables: Long term decrease in deep-rooted perennial grass density.

Threshold: Loss of deep-rooted perennial bunchgrasses changes spatial and temporal nutrient cycling and nutrient redistribution, and reduces soil organic matter.

T2B: Transition from Current Potential State 2.0 to Annual State 4.0

Trigger: To Community Phase 4.1: Severe fire and/or soil disturbing treatments. To Community Phase 4.2: Inappropriate grazing management that favors shrubs in the presence of non-native species.

Slow variables: Increased production and cover of non-native annual species.

Threshold: Loss of deep-rooted perennial bunchgrasses and shrubs truncates, spatially and temporally, nutrient capture and cycling within the community. Increased, continuous fine fuels from annual non-native plants modify the fire regime by changing intensity, size and spatial variability of fires.

Shrub State 3.0:

This state is a product of many years of heavy grazing during time periods harmful to perennial bunchgrasses. Sandberg bluegrass may increase with a reduction in deep rooted perennial bunchgrass competition and may become the dominate grass or the herbaceous understory may be completely eliminated. Sagebrush dominates the overstory and spiny hopsage, Nevada ephedra and/or rabbitbrush may be a significant component. Sagebrush cover exceeds site concept and may be decadent, reflecting stand maturity and lack of seedling establishment due to competition with mature plants. The shrub overstory dominates site resources such that soil water, nutrient capture, nutrient cycling and soil organic matter are temporally and spatially redistributed. Bare ground may be significant with soil redistribution occurring between interspace and canopy locations.

Community Phase 3.1:

Wyoming big sagebrush dominates overstory and spiny hopsage, ephedra and/or rabbitbrush may be a significant component. Deep-rooted perennial bunchgrasses may be present in trace amounts or absent from the community. Sandberg bluegrass may dominate the understory. Annual nonnative species are present and may be co-dominant. Bare ground is significant. .

Community Phase Pathway 3.1a: Fire, heavy fall grazing causing mechanical damage to shrubs, and/or brush treatments with minimal soil disturbance, will greatly reduce the overstory shrubs to trace amounts and allow Sandberg bluegrass to dominate the site.

Community Phase 3.2

Bluegrass dominates the site; annual non-native species may be present but are not dominant. Trace amounts of sagebrush may be present. Sprouting shrubs such as spiny hopsage, Nevada ephedra, horsebrush or rabbitbrush may be dominant.

Community Phase Pathway 3.2a: Time and lack of disturbance and/or grazing management that favors the establishment and growth of sagebrush allows the shrub component to recover. The re-establishment of Wyoming big sagebrush can take many years.

T3A: Transition from Shrub State 3.0 to Annual State 4.0

Trigger: Severe/repeated fire and/or soil disturbing treatments. Possible soil disturbing treatments include attempted restoration with drought tolerant perennials, such as crested wheatgrass. Restoration attempts causing soil disturbance will likely initiate a transition to an annual state. Probability of success very low. Inappropriate grazing management in the presence of annual non-native species.

Slow variables: Increased production and cover of non-native annual species.

Threshold: Increased, continuous fine fuels modify the fire regime by changing intensity, size and spatial variability of fires. Changes in plant community composition and spatial variability of vegetation due to the loss of perennial bunchgrasses and sagebrush truncate energy capture spatially and temporally thus impacting nutrient cycling and distribution.

R3A: Restoration from Shrub State 3.0 to Current Potential State 2.0

Brush management with minimal soil disturbance, coupled with seeding of deep rooted perennial native bunchgrasses. Probability of success very low.

Annual State 4.0:

This community is characterized by the dominance of annual non-native species such as cheatgrass and tansy mustard in the understory. Sprouting shrubs such as rabbitbrush, shadscale, broom snakeweed and spiny hopsage may dominate the overstory. Annual species are controlling site resources causing changes in the spatial distribution of nutrients and organic matter. Infiltration and therefore soil moisture is reduced due to the absence of deep-rooted perennial plants.

Community Phase 4.1

Annual non-native plants such as cheatgrass or tansy mustard dominate the site. Rabbitbrush may or may not be present.

Community Phase Pathway 4.1a: Time and lack of fire allows for the sagebrush or other shrubs to establish. Probability of sagebrush establishment is extremely low.

Community Phase 4.2: Sprouting shrubs such as ephedra, spiny hopsage and rabbitbrush dominate overstory. Wyoming big sagebrush may be a minor component. Annual non-native species dominate understory. Trace amounts of desirable bunchgrasses may be present. Bare ground is significant.

Community Phase Pathway 4.2a: Fire removes shrubs and allows for annual non-native species to dominate the site.

State 1

Reference Plant Community

Community 1.1

Reference Plant Community

The reference plant community is dominated by desert needlegrass and Wyoming big sagebrush. Potential vegetative composition is about 65% grasses, 5% forbs and 30% shrubs. Approximate ground cover (basal and crown) is 25 to 35 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	292	455	650
Shrub/Vine	135	210	300
Forb	23	35	50
Total	450	700	1000

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Primary Perennial Grasses			364–476	
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	350–420	—
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	14–56	—
2	Secondary Perennial Grasses			14–56	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	3–14	—
	basin wildrye	LECI4	<i>Leymus cinereus</i>	3–14	—
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	3–14	—
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	3–14	—
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	3–14	—
Forb					
3	Perennial Forbs			14–56	
	four o'clock	MIRAB	<i>Mirabilis</i>	3–14	—
	globemallow	SPHAE	<i>Sphaeralcea</i>	3–14	—
	princesplume	STANL	<i>Stanleya</i>	3–14	—
Shrub/Vine					
4	Primary Shrubs			169–301	
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	14–56	—
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	15–35	—
5	Secondary Shrubs			14–70	
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	3–21	—
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	3–21	—
	water jacket	LYAN	<i>Lycium andersonii</i>	3–21	—
	desert peach	PRAN2	<i>Prunus andersonii</i>	3–21	—

Animal community

Livestock Interpretations:

This site is suitable for livestock grazing. 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. Indian ricegrass is highly palatable to all classes of livestock in both green and cured condition. It supplies a source of green feed before most other native grasses have produced much new growth. 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:

Wyoming big sagebrush is preferred browse for wild ungulates. Pronghorn usually browse Wyoming big sagebrush heavily. 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. Indian ricegrass is eaten by pronghorn in moderate amounts whenever available. A number of heteromyid rodents inhabiting desert rangelands show preference for seed of Indian ricegrass. Indian ricegrass is an important component of jackrabbit diets in spring and summer. Indian ricegrass seed provides food for many species of birds. Doves, for example, eat large amounts of shattered Indian ricegrass seed lying on the ground.

Hydrological functions

Runoff is low. Permeability is moderately rapid.

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

Indian ricegrass was traditionally eaten by some Native Americans. The Paiutes used the seed as a reserve food source.

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: Mineral County, NV	
Township/Range/Section	T7N R30E S35
General legal description	About 8 miles south of Hawthorne along NvHwy 31, Whisky Flat area, Mineral County, Nevada. This site also occurs in Churchill, Lyon, Pershing and Storey Counties, Nevada.

Other references

Fire Effects Information System (Online; <http://www.fs.fed.us/database/feis/plants/>).

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	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills are none to few 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, short and stable.

3. **Number and height of erosional pedestals or terracettes:** None

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%

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** None

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 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. (To be field tested)
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is single grained. Soil surface colors are light brownish-gray and soils are typified by an ochric epipedon. Organic matter of the surface 2 to 3 inches is typically less than 1 percent dropping off quickly below. Organic matter content can be more or less depending on micro-topography.
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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.
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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):** None. Massive sub-surface structure should not be interpreted as compaction.
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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

Sub-dominant: evergreen shrubs > associated shrubs > shallow-rooted, cool season, perennial grasses = deep-rooted, cool season, perennial forbs = fibrous, shallow-rooted, cool season, annual and perennial forbs > warm season, perennial grasses

Other:

Additional: After wildfires, perennial bunchgrasses and sprouting shrubs (ephedra, spiny hopsage, rabbitbrush) dominate. Big sagebrush is removed for several years.

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 interspaces 20-30%; <¼ in. depth
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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 (March thru June) ± 700 lbs/ac; Favorable years ± 1000 lbs/ac; unfavorable years ± 450 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: Potential invaders include cheatgrass, annual mustards, halogeton and Russian thistle.
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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 or reproduction occurs during extreme or extended drought periods.
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