USDA Natural Resources
Conservation Service

Ecological site R027XY013NV
LOAMY 4-8 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 4-8 P.Z. site occurs on piedmont slopes, alluvial plains, and relict alluvial fans. Slopes range from 0 to 30 percent, but slope gradients of 2 to 8 percent are most typical. Elevations are 3600 to 7000 feet. The soils associated with this site are deep but have a restrictive layer that restricts root penetration.

Associated sites

R027XY010NV	**BEACH TERRACE** Less productive site; PIDE4 not a codominant shrub.

Similar sites

R027XY017NV	**SOUTH SLOPE 4-8 P.Z.** ACSP12 dominant grass.
R027XY018NV	**GRAVELLY LOAM 4-8 P.Z.** SABA14-ATCO codominant shrubs.
R027XY015NV	**STONY LOAM 4-8 P.Z.** SABA14-ATCO codominant shrubs; PLJA important grass.
R027XY019NV	**STONY SLOPE 4-8 P.Z.** SABA14-ATCO codominant shrubs.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex confertifolia* (2) *Picrothamnus desertorum*
Herbaceous	(1) *Achnatherum hymenoides*

Physiographic features

This site occurs on piedmont slopes, alluvial plains, and relict alluvial fans. Slopes range from 0 to 30 percent, but slope gradients of 2 to 8 percent are most typical. Elevations are 3600 to 7000 feet.

Table 2. Representative physiographic features

Landforms	(1) Fan piedmont (2) Alluvial fan (3) Alluvial flat
Runoff class	Very low to very high
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Rare to occasional
Ponding frequency	None
Elevation	1,097–2,134 m
Slope	0–30%

Water table depth	0 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate on this site is arid, characterized by cool, moist winters, and hot, dry summers. Average annual precipitation is 4 to 8 inches. Mean annual air temperature is 45 to 57 degrees F. The average growing season is about 110 to 150 days.

Table 3. Representative climatic features

Frost-free period (average)	150 days
Freeze-free period (average)	
Precipitation total (average)	203 mm

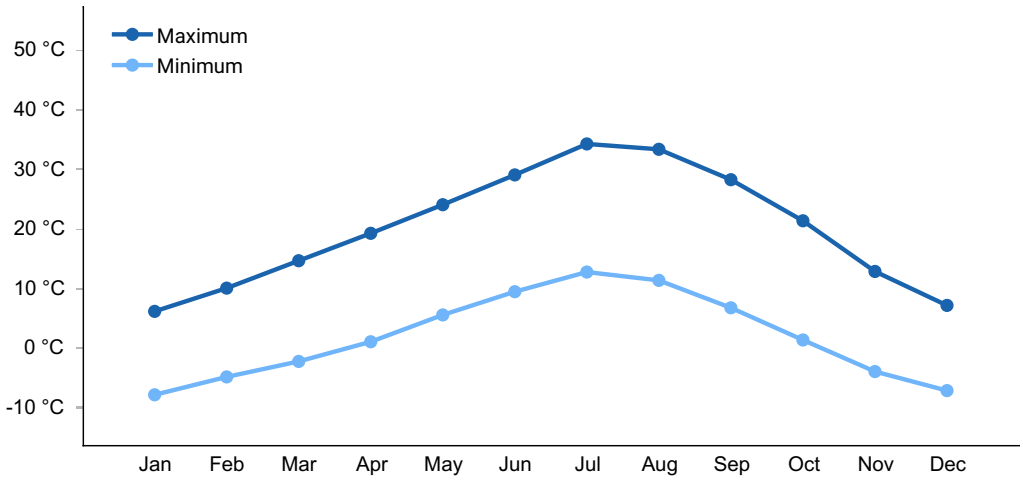


Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are deep but have a restrictive layer that restricts root penetration. These soils formed in alluvium derived from mixed rock sources, loess, and volcanic ash. Surface soils are typically medium to moderately coarse textured. The available water capacity is low to high, varying with soil texture and depth. Surface soil reaction ranges from slight to strongly alkaline and pH increases with depth in the soil profile. In many of these soils, moderate to heavy concentrations of salts and sodium accumulate in the lower subsoil. Desert pavement is common in some areas. Soils having a high percentage of rock fragments on the surface are less subject to erosion. Runoff is high to very high. Potential for sheet and rill erosion is slight to moderate depending on

slope and presence of rock fragments on the soil surface. The soil moisture regime is typic aridic and the soil temperature regime is mesic. The soil series associated with this site includes; Aboten, Bedwyr, Biga, Bluewing, Chilper, Cleaver, Dorper, Dun Glen, Fireball, Ganaflan, Granshaw, Hessing, Inmo, Jerval, Knoss, Mazuma, Pirouette, Rednik, Rezave, Ricert, Swingler, Theon, Trocken, Whirlo, and Wholan.

A representative soil series is Dorper, a fine smectitic, mesic Durinodic Natrargids. An ochric epipedon occurs from the soil surface to 18 cm and a natric horizon occurs from 18 to 43 cm. Secondary carbonates occurs from 18 to 152 cm.

Table 4. Representative soil features

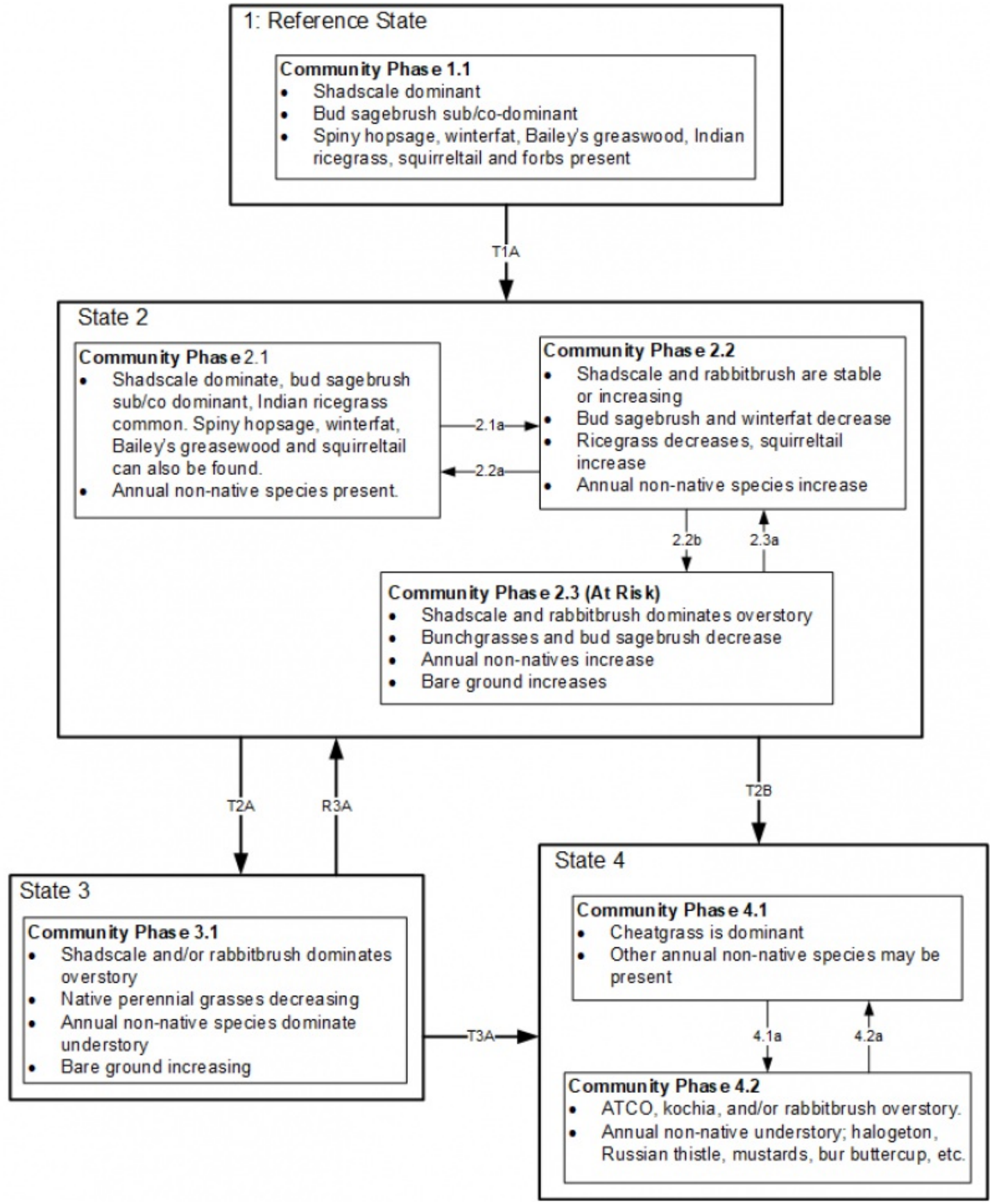
Parent material	(1) Alluvium (2) Alluvium–granite (3) Loess
Surface texture	(1) Very gravelly very fine sandy loam (2) Gravelly loam (3) Stony loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Very slow to very rapid
Soil depth	183–213 cm
Surface fragment cover <=3"	20–65%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	7.62–19.3 cm
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	0–32 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–100
Soil reaction (1:1 water) (0-101.6cm)	8.2–8.8
Subsurface fragment volume <=3" (Depth not specified)	5–35%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

Where management results in abusive grazing use by livestock or wild horses, Bailey's greasewood, shadscale, and Douglas' rabbitbrush, increase in the plant community as Indian ricegrass and other desirable forage plants decrease. With continued over utilization, particulary during the late-winter/early-spring period, shadscale will decrease. Sandberg's bluegrass is most prevalent where surface soils are high in volcanic ash content. Species likely to invade this site are galleta, Douglas' rabbitbrush, horsebrush, burrobrush, snakeweed, halogeton, Russian thistle, cheatgrass and annual mustards.

Fire Ecology:
Historically, shadscale shrub communities were free of exotic invaders, and seeded range grasses produced relatively low amounts of fine fuels. A lack of continuous fuels to carry fires made fire rare to non-existent in shadscale communities. Shadscale is generally killed by fire. It does not readily recover from fire, except for establishment through seed. Budsage is killed by fire. Budsage is similar to shadscale in general growth form, and like shadscale communities, budsage communities rarely burn. Winterfat is either killed or top-killed by fire, depending on fire severity. Severe fire can kill the perennating buds located several inches above the ground surface and thus kills the plant. In addition, severe fire usually destroys seed on the plant. Low-severity fire scorches or only partially consumes the aboveground portions of winterfat and thus does not cause high mortality. Indian ricegrass is generally killed by fire. Indian ricegrass reestablishes on burned sites through seed dispersed from adjacent unburned areas. 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



Reference State 1.0:
State dynamics are maintained by interactions between climatic patterns and disturbance regimes. Negative feedbacks enhance ecosystem resilience and contribute to the overall stability. These include the presence of all structural and functional groups, low fine fuel loads, and retention of organic matter and nutrients. Under natural condition this site is very stable, with little variation in plant community composition. Plant community changes would be reflected in production response to long term drought or herbivory.

Community Phase 1.1:
This community is dominated by shadscale, bud sagebrush, and Indian ricegrass. Bottlebrush squirreltail, spiny hopsage, Bailye's greasewood and winterfat are important, but minor components within this community. Community phase changes are primarily a function of chronic drought. Drought favors shrubs over perennial bunchgrasses. However, long-term drought will result in an overall

decline in plant community production, regardless of functional group. Extreme growing season wet periods may also reduce the shadscale component. Fire is very infrequent to non-existent.

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 plants, such as halogeton, mustards and cheatgrass.
Slow variables: Over time the annual non-native species 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-native annuals. 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:
This community is compositionally similar to the reference plant community with a trace of annual non-natives, primarily cheatgrass, halogeton and/or tansy mustard. Non-native species may also include seeded perennials and parasitic plants like dodder. Ecological resilience is reduced by the presence of non-native species. Community phase changes are primarily a function of chronic drought or extreme wet periods. Fire is infrequent and patchy due to low fuel loads.
Community Phase Pathway 2.1a: Inappropriate growing season grazing favors unpalatable shrubs over bunchgrasses, winterfat and bud sagebrush. Long term drought will also decrease the perennial bunchgrasses in the understory.

Community Phase 2.2: Shadscale dominates overstory while rabbitbrush may become sub-dominate. Bud sagebrush may become minor component with excessive spring grazing. Sandberg bluegrass may dominate the understory whereas Indian ricegrass becomes a minor component. Bare ground interspaces increase in size and connectivity. Annual non-native weeds such as bur buttercup and halogeton increase. Prolonged drought may lead to an overall decline in the plant community. Wet periods may decrease the shadscale component. If present.
Community Phase Pathway 2.2a: Release from drought and/or grazing management that facilitates an increase in perennial grasses and bud sagebrush.
Community Phase Pathway 2.2b: Long term drought and/or inappropriate grazing management will significantly reduce perennial grasses and bud sagebrush in favor of shadscale and rabbitbrush.

Community Phase 2.3 (At-risk):
Shadscale and rabbitbrush dominates the overstory and perennial bunchgrasses and bud sagebrush are reduced, either from competition with shrubs, inappropriate grazing, chronic drought or a combination. Annual non-native species may be stable or increasing due to a lack of competition with perennial bunchgrasses. Bare ground may be significant. This community is at risk of crossing a threshold to either State 3.0 (shrub) or State 4.0 (annual).
Community Phase Pathway 2.3a: Release from drought and/or inappropriate grazing allows for bud sagebrush and perennial grasses to increase. Extreme growing season wet period may reduce shadscale.

T2A: Transition from Current Potential State 2.0 to Shrub State 3.0:
Trigger: Inappropriate grazing management and/or prolonged drought will decrease or eliminate deep rooted perennial bunchgrasses and favor shrub growth and establishment.
Slow variables: Long term decrease in grass density and reduced native species (shrub and grass) recruitment rates. Increased reproduction of non-native invasive species.
Threshold: Loss of deep-rooted perennial bunchgrasses changes nutrient cycling, nutrient redistribution, and reduces soil organic matter.

T2B: Transition from Current Potential State 2.0 to Annual State 4.0:
Trigger: Fire and/or soil disturbing treatments such as drill seeding and plowing (failed seeding attempt). Increased spring moisture may facilitate the increased germination and production of cheatgrass leading to its dominance within the community.
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 characterized by shadscale, bud sagebrush or a sprouting shrub overstory with very little to no understory. The site has crossed a biotic threshold and site processes are being controlled by shrubs. Shrub cover exceeds the 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 and nutrients are temporally and spatially redistributed. Bare ground has increased.

Community Phase 3.1:
Decadent shadscale and bud sagebrush dominate the overstory. Rabbitbrush and/or other sprouting shrubs may be a significant component or dominant shrub. Deep-rooted perennial bunchgrasses may be present in trace amounts or absent from the community. Annual nonnative species increase. Bare ground is significant.
T3A: Transition from Shrub State 3.0 to Annual State 4.0:
Trigger: Fire and/or soil disturbing treatments such as drill seeding and plowing.
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. Changes in plant

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

R3A: Restoration from Shrub state 3.0 to Seeded State 5.0: Shrub management and seeding of desired species with minimal soil disturbance. This pathway has a low probability of success due to limited annual precipitation and soil moisture.

Annual State 4.0: This state consists of two general community phases; one dominated by annual forbs and the other dominated by annual grass. Shadscale/rabbitbrush may with the present with the annual understory. In this state, a biotic threshold has been crossed and state dynamics are driven by the dominance and persistence of non-native annuals which is perpetuated by a shortened fire return interval. The herbaceous understory is dominated by annual non-native species such as cheatgrass and halogeton. Bare ground may be abundant.

Community Phase 4.1:
This plant community phase is dominated by non-native annual grasses. This plant community is at-risk of increased erosion and soil loss or redistribution and reoccurring fire driven by fine fuels. Prescribed grazing may be used to reduce fuel loading and the cheatgrass seedbank. However, caution should be exercised; inappropriate grazing management resulting in the complete defoliation of the site will lead to a more degraded state.

Community Phase Pathway 4.1a: Seeding of shrub species may result in an increase in shadscale, forage kochia and other species on this site (probability of success is very low)
Community Phase 4.2:
This community is dominated by shadscale and/or rabbitbrush with annual non-native species dominating the understory. Forage kochia and other seeded species may be present in the community. This site is at risk of increased erosion and soil loss and an increase risk of fire due to the fine fuel loads.
CPP 4.2: fire or

State 1
Reference State

Community 1.1
Reference Plant Community

The reference plant community is characterized by a open canopy of shrubs and perennial grasses. The plant community is dominated by shadscale, bud sagebrush and Indian ricegrass. Potential vegatative composition is about 35% grasses, 5% forbs, and 60% shrubs. Approximate ground cover (basal and crown) is 15 to 25 percent. Bare ground is 30 to 50%, surface cover of rock fragments are variable but often more than 45%, shrub canopy 15 to 25%, foliar cover for perennial herbaceous plants <15%. Dead branches within individual shrubs are common and standing dead shrub canopy material may be as much as 35% of total woody canopy. Some of the mature bunchgrasses commonly (approximately 25%) have dead centers. Between plant interspaces litter is less than 5% cover and the depth of litter is approximately one-fourth inch.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	168	269	404
Grass/Grasslike	98	157	235
Forb	15	22	34
Total	**281**	**448**	**673**

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**			96–252	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	76–151	–
	squirreltail	ELEL5	*Elymus elymoides*	10–50	–
	Sandberg bluegrass	POSE	*Poa secunda*	10–50	–
2	**Secondary Perennial Shrubs**			10–40	
	desert needlegrass	ACSP12	*Achnatherum speciosum*	2–13	–
	James' galleta	PLJA	*Pleuraphis jamesii*	2–13	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	2–13	–
Forb					
3	**Perennial**			10–40	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	2–13	–
	globemallow	SPHAE	*Sphaeralcea*	2–9	–
Shrub/Vine					
4	**Primary Perennial Shrubs**			213–354	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	127–177	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	76–127	–
	Forb, perennial	2FP	*Forb, perennial*	8–31	–
	globemallow	SPHAE	*Sphaeralcea*	2–9	–
5	**Secondary Perennial Shrubs**			26–76	
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	2–13	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	2–13	–
	spiny hopsage	GRSP	*Grayia spinosa*	2–13	–
	Bailey's greasewood	SABA14	*Sarcobatus baileyi*	2–13	–
	littleleaf horsebrush	TEGL	*Tetradymia glabrata*	2–13	–

Animal community

Livestock Interpretations:
This site is suitable for livestock grazing. Grazing management should be keyed to perennial grass and palatable shrub production. Indian ricegrass is often used most heavily in late winter, when succulent and nutritious new green leaves are produced. It supplies a source of green feed before most other native grasses have produced much new growth. Consequently, Indian ricegrass is often heavily grazed before animals leave winter ranges. Indian ricegrass also produces abundant foliage in spring and early summer when it is readily eaten. It cures well and provides excellent winter forage for cattle, domestic sheep, 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. 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. Shadscale is a valuable and palatable browse species for livestock. Shadscale provides good browse for domestic sheep and goats. Shadscale leaves and seeds are an important component of domestic sheep and cattle winter diets. The spiny branches are unsuitable for cattle. Seeds are the most palatable part of shadscale. Budsage can be poisonous or fatal to calves when eaten in large quantities. Indian ricegrass has good forage value for domestic sheep, cattle, and horses. It can be important cattle forage in winter, particularly in salt desert communities. Winterfat is an important forage plant for livestock, especially during winter when forage is scarce. Abusive grazing practices have reduced or eliminated winterfat on some areas even though it is fairly resistant to browsing. Effects depend on severity and season of grazing.

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:
Shadscale is a valuable browse species, providing a source of palatable, nutritious forage for a wide variety of wildlife. The fruits and leaves are a food source for deer, desert bighorn sheep, pronghorn antelope, small rodents, jackrabbits, game birds, and songbirds. Shadscale is good browse for mule deer, which feed upon shadscale during winter, spring, and fall. Shadscale is a minor component of desert bighorn sheep diets. Although it is not preferred, shadscale may provide winter forage for pronghorn antelope. Shadscale habitats of northeastern Nevada are important home ranges for small mammals. Chisel-toothed kangaroo rats feed on shadscale foliage and use shadscale habitats during the spring, summer, and fall. Deer mice use shadscale habitats all year. Shadscale leaves and seeds are preferred forage for jackrabbits. The Great Basin kangaroo rat also feeds on

shadscale foliage. Budsage is palatable, nutritious forage for upland game birds, small game, big game and domestic sheep in winter, particularly late winter. Budsage is rated as regularly or moderately eaten by mule deer in Nevada in winter and is utilized by bighorn sheep in summer. Chukar eat the leaves and seeds of budsage in Nevada. Winterfat is an important forage plant for Wildlife, especially during winter when forage is scarce. Winterfat seeds are eaten by rodents. Winterfat is a staple food for black-tailed jackrabbit. Mule deer and pronghorn antelope browse winterfat. Winterfat is used for cover by rodents. It is potential nesting cover for upland game birds, especially when grasses grow up through its crown. Indian ricegrass is eaten by pronghorn antelope in moderate amounts whenever available. In Nevada, Indian ricgrass is consumed by desert bighorn sheep. Bottlebrush squirreltail is a dietary component of several wildlife species. Bottlebrush squirreltail may provide forage for mule deer and pronghorn.

Hydrological functions

Potential for sheet and rill erosion is slight to moderate depending on slope and presence of rock fragments on the soil surface. A few can be expected on steeper slopes in area subjected to summer convection storms or rapid spring snowmelt. Water flow patterns are often numerous in areas subjected to summer convection storms and are short and stable. Pedestals are rare and occurence is typically limited to areas within water flow patterns. Fine litter (foliage from grasses and annual and perennial forbs) are expected to move the distance of slope length during intense summer convection storms or rapid snowmelt events. Sparse shrub canopy and associated litter break raindrop impact. Medium to fine textured surface soils have moderate to slow infiltration and medium runoff.

Recreational uses

This site offers opportunities for photography and nature study. This site has potential for off-road vehicle use and hiking.

Other products

Historically, shadscale was a food source for native Americans of the southwestern United States. Seeds were used by native Americans of Arizona, Utah and Nevada for bread and mush.
Indian ricegrass was traditionally eaten by some Native American peoples. The Paiutes used seed as a reserve food source.

Other information

Revegetation of shadscale communities is inherently difficult. Dry soil surfaces resulting from low humidity, high irradiation, and moderate to strong winds are major obstacles in revegetation projects.
Budsage is difficult to seed because of its shallow, fibrous root system, budsage can be used for soil stabilization and erosion control. Winterfat adapts well to most site conditions,

and its extensive root system stabilizes soil. However, winterfat is intolerant of flooding, excess water, and acidic soils. Indian ricegrass is well-suited for surface erosion control and desert revegetation although it is not highly effective in controlling sand movement. Bottlebrush squirreltail is tolerant of disturbance and is a suitable species for revegetation.

Inventory data references

NV-ECS-1: 49 records
NRCS-RANGE-417: 4 records
NV-4400-13(BLM): 4 records

Type locality

Location 1: Pershing County, NV	
Township/Range/Section	T27 N R26 E S33
General legal description	About 3 miles west of Blue Wing Flat, Granite Springs Valley area, Pershing County, Nevada. This site also occurs in Churchhill, Lyon and Mineral county, Nevada.

Other references

USDA-NRCS Plant Database (Online; http://plants.usda.gov/).

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)	GK BRACKLEY

Contact for lead author	State Rangeland Management Specialist
Date	06/20/2006
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills are rare. A few can be expected on steeper slopes in areas subjected to summer convection storms or rapid spring snowmelt.

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2. **Presence of water flow patterns:** Water flow patterns are often numerous in areas subjected to summer convection storms. Flow patterns short and stable.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals are rare with occurrence typically limited to area within water flow patterns. Frost heaving of shallow rooted plants should not be considered as normal condition.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground 30 to 50%; surface cover of rock fragments variable but often more than 45%; shrub canopy 15 to 25%; foliar cover for perennial herbaceous plants <15%.

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5. **Number of gullies and erosion associated with gullies:** Gullies are none to rare.

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

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7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter (foliage from grasses and annual & perennial forbs) is expected to move the distance of slope length during intense summer convection storms or rapid snowmelt events. 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 2 to 4 on most soil textures found on this site. (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 typically fine to medium platy or prismatic. Soil surface colors are pale browns and the soils are typified by an ochric epipedon. Organic carbon of the surface 2 to 3 inches is less than to 1 percent.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Sparse shrub canopy and provide some protection from raindrop impact. Medium to fine textured surface soils have moderate to slow infiltration and medium 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):** Compacted layers are none. Prismatic or massive sub-surface horizons, or subsoil argillic horizons are not to be interpreted as compacted layers.

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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: Reference Plant Community: Low-statured salt desert shrubs (shadscale & bud sagebrush) >> deep-rooted, cool season, perennial bunchgrasses. (By above ground production)

    Sub-dominant: Associated shrubs > shallow-rooted, cool season, perennial grasses > deep-rooted, cool season, perennial forbs = fibrous, shallow-rooted, cool season, annual and perennial forbs. (By above ground production)

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Dead branches within individual shrubs are common and standing dead shrub canopy material may be as much as 35% of total woody canopy; mature bunchgrasses commonly (±25%) have dead centers.

14. **Average percent litter cover (%) and depth (in):** Between plant interspaces (10-20%) and depth of litter is ± ¼ inch.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season (February thru April [May]) ± 400 lbs/ac; Spring moisture significantly affects total production. Favorable years ± 600 lbs/ac and unfavorable years ± 250 lbs/ac.

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, halogeton, Russian thistle, and annual mustards.

17. **Perennial plant reproductive capability:** All functional groups should reproduce in average and above average growing season years. Little growth or reproduction occurs in drought years.