USDA Natural Resources Conservation Service

Ecological site R027XY015NV
STONY LOAM 4-8 P.Z.

Last updated: 6/03/2024
Accessed: 07/17/2024

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 Stony Loam 4-8 P.Z. site occurs on summits and sideslopes of upper piedmont slopes, alluvial fans, and fan remnants on all exposures. Slopes are less than 30 percent, but slopes of 2 to 15 percent are most typical. Elevations are 4400 to 6700 feet. The soils are very deep, or have a shallow depth to duripan, a layer restrictive to root development. These soils have formed in alluvium derived from volcanic rocks. Soil surfaces have high amounts of black-colored, volcanic rock with over 50 percent ground cover of stones and cobbles.

Associated sites

R027XY018NV	**GRAVELLY LOAM 4-8 P.Z.** PIDE4 major shrub; more productive site

Similar sites

R027XY013NV	**LOAMY 4-8 P.Z.** ATCO dominant shrub
R027XY017NV	**SOUTH SLOPE 4-8 P.Z.** ACSP12 dominant grass
R027XY037NV	**LOAMY SLOPE 5-8 P.Z.** ATCO dominant shrub; less productive site
R027XY019NV	**STONY SLOPE 4-8 P.Z.** SABA14-ATCO codominant shrubs.
R027XY027NV	**BARREN GRAVELLY SLOPE 4-8 P.Z.** Less productive site; ATCO dominant shrub; SABA14 minor shrub, if present

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Sarcobatus baileyi* (2) *Atriplex confertifolia*
Herbaceous	(1) *Achnatherum hymenoides*

Physiographic features

The Stony Loam 4-8 P.Z. site occurs on summits and sideslopes of upper piedmont slopes, alluvial fans, and fan remnants on all exposures. Slopes range from 0 to 30 percent, but slopes of 2 to 15 percent are most typical. Elevations are 4400 to 6700 feet.

Table 2. Representative physiographic features

Landforms	(1) Fan remnant (2) Alluvial fan
Runoff class	Very high
Flooding frequency	None
Ponding frequency	None
Elevation	1,341–2,042 m
Slope	0–30%
Water table depth	183 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate associated with 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 48 to 54 degrees F. The average growing season is about 100 to 130 days.

Table 3. Representative climatic features

Frost-free period (average)	130 days
Freeze-free period (average)	
Precipitation total (average)	203 mm

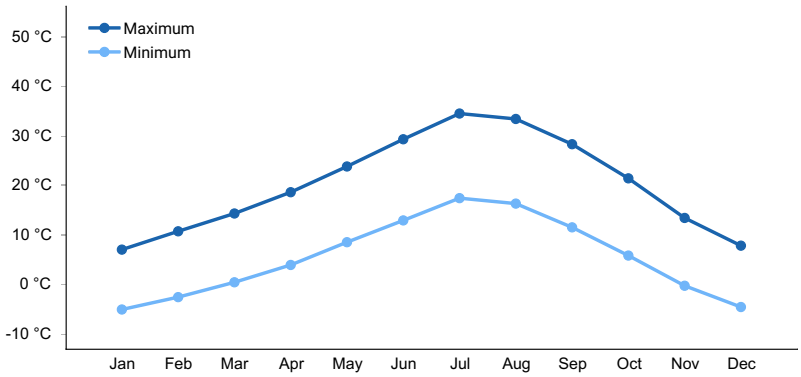


Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils are shallow to a duripan, a layer restrictive to root development. These soils have formed in alluvium derived from volcanic rocks. Soil surfaces have high amounts of black-colored, volcanic rock with over 50 percent ground cover of stones and cobbles. These soils usually are modified by a high volume of rock fragments through the soil profile, reducing the potential soil water holding capacity. Soil stability values should be 2 to 4 on most soil textures found on this site. Areas of this site occurring on soils that have a physical crust will probably have stability values less than 3. The soils that are associated with this site are Gamgee, Nemico, and Smedley.

Table 4. Representative soil features

Parent material	(1) Alluvium (2) Alluvium–volcanic rock

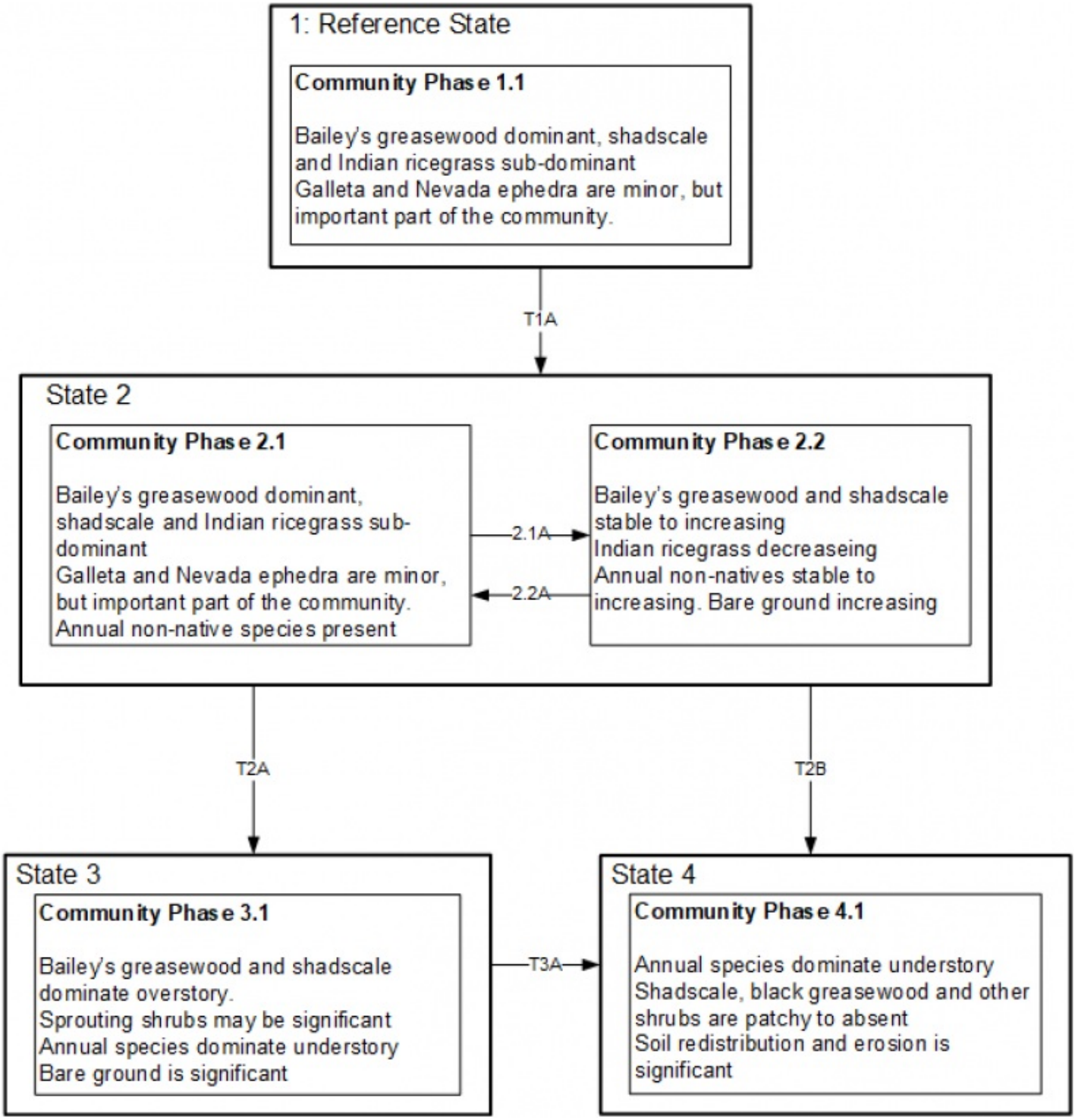
Surface texture	(1) Very gravelly sandy loam (2) Very stony sandy loam (3) Stony sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Very slow to slow
Soil depth	25–183 cm
Surface fragment cover <=3"	20–54%
Surface fragment cover >3"	1–20%
Available water capacity (0-101.6cm)	4.83–11.68 cm
Calcium carbonate equivalent (0-101.6cm)	0–5%
Electrical conductivity (0-101.6cm)	0–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–60
Soil reaction (1:1 water) (0-101.6cm)	6.6–9
Subsurface fragment volume <=3" (Depth not specified)	7–53%
Subsurface fragment volume >3" (Depth not specified)	2–23%

Ecological dynamics

As ecological condition deteriorates Bailey's greasewood, shadscale and galleta increase. Galleta often dominates the aspect after wildfire. Species likely to invade this site are annuals such as brome grasses, mustard, cheatgrass, galleta, Douglas' rabbitbrush, horsebrush, burrobrush, snakeweed, Russian thistle and halogeton.

Fire Ecology:
The mean fire return interval for shadscale-greasewood communities range from 35 to 100 years. Salt-desert shrub communities are usually unaffected by fire because of low fuel loads, although a year of exceptionally heavy winter rains can generate fuels by producing a heavy stand of annual forbs and grasses. Increased presence of non-native annual grasses, such as cheatgrass, can alter fire regimes by increasing fire frequency under wet to near-normal summer moisture conditions. When fire does occur, the effect on the ecosystem may be extreme. Bailey's greasewood may be killed by severe fires, but it commonly sprouts soon after low to moderate-severity fire. 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. 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. Galleta is a rhizomatous perennial which can resprout after top-kill by fire. Needlegrasses are damaged by burning due to the dense plant material that can burn slowly and long, charring to the growing points. Late summer and early fall fires are the least harmful.

State and transition model



Reference State: 1.0
State 1.0 is representative of the natural range of variability under pristine conditions. The site is dominated by deep-rooted cool season, perennial bunchgrasses and drought tolerant shrubs with high root to shoot ratios. 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 are primarily driven by drought. Wet years will increase grass production, while drought years will reduce production. Shrub production will also increase during wet years; however, extreme growing season wet periods has been shown to cause shadscale death. Fire is rare and not a important driver in this community.

Community Phase 1.1:
Community phase 1.1 is stable and long-lived. It is dominated by Bailey's greasewood and shadscale with an understory of Indian ricegrass Nevada ephedra, bud sagebrush, and galleta 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.

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 invasive weeds. 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 State Community Phase 1.1 with the presence of non-native species in trace amounts. This community is characterized by Bailey's greasewood and shadscale with an understory of Indian ricegrass, galleta and non-native annuals. 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: Long-term drought and excessive growing season grazing favor shrubs over perennial bunchgrass.

Community Phase 2.2:
Greasewood and shadscale increase while Indian ricegrass and other deep-rooted perennial grasses decrease. Bare ground increases along with non-native annuals. Prolonged drought may lead to an overall decline in the plant community. Prolonged wet periods will decrease the shadscale component.
Community Phase Pathway 2.2a: Release from drought and/or appropriate grazing management that facilitates an increase in perennial grasses and desirable shrub species.

T2A: Transition from Current Potential State 2.0 to Shrub State 3.0:
Trigger: Long-term inappropriate grazing and/or long-term drought will decrease or eliminate deep rooted perennial bunchgrasses and favor shrub growth and establishment.
Slow variables: Long term decrease in deep-rooted perennial grass density.
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. An unusually wet spring 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 has one community phase that is characterized by shadscale, Bailey's greasewood and/or rabbitbrush 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, nutrient capture, nutrient cycling and soil organic matter are temporally and spatially redistributed. Bare ground has increased.
Community Phase 3.1:
Decadent shrubs, Bailey's greasewood and shadscale dominate the overstory. Rabbitbrush and/or other sprouting shrubs may be a significant component. 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. An unusually wet spring 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: 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 shadscale truncate energy capture spatially and temporally thus impacting nutrient cycling and distribution.

Annual State 4.0: In this state, a biotic threshold has been crossed and state dynamics are driven by the dominance and persistence of the annual plant community 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. Resiliency has declined and further degradation from fire facilitates a cheatgrass and sprouting shrub plant community. The fire return interval has shortened due to the dominance of cheatgrass in the understory and is a driver in site dynamics.

Community Phase 4.1:
This community is dominated by annual non-native species. Bailey's greasewood, which can sprout after fire, maybe be present in patches but are not contributing to site function. Shadscale may be increasing within the community. Annual non-native species dominated the understory. Halogeton most commonly invades these sites. Bare ground may be abundant, especially during low precipitation years. Soil erosion from wind and soil temperature are driving factors in site function.

State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The reference plant community is dominated by Bailey's greasewood, shadscale and Indian ricegrass. Other important species on this site are galleta and Nevada ephedra. Potential vegetative composition is about 45% grasses, 5% forbs and 50% shrubs. Approximate ground cover (basal and crown) is 10 to 20 percent. Bare ground is approximately 25%, surface rock cover is 50 to 60%, shrub canopy approximately 15% and basal area for perennial herbaceous plants approximately 5%. Dead branches within individual shrubs are common and standing dead shrub canopy material may be as much as 40% of total woody canopy. Some of the mature bunchgrasses commonly have dead centers. Fine litter between plant interspaces is approximately trace to 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	112	196	280
Grass/Grasslike	101	176	252
Forb	11	19	28
Total	**224**	**391**	**560**

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**			75–178	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	59–99	–
	James' galleta	PLJA	*Pleuraphis jamesii*	8–59	–
	desert needlegrass	ACSP12	*Achnatherum speciosum*	8–20	–
2	**Secondary Perennial Grasses**			8–31	
	squirreltail	ELEL5	*Elymus elymoides*	2–12	–
	needle and thread	HECO26	*Hesperostipa comata*	2–12	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	2–12	–
Forb					
3	**Perennial**			8–39	
	globemallow	SPHAE	*Sphaeralcea*	2–16	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	2–10	–
Shrub/Vine					
4	**Primary Perennial Shrubs**			166–257	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	59–99	–
	Forb, perennial	2FP	*Forb, perennial*	6–24	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	8–20	–
	globemallow	SPHAE	*Sphaeralcea*	2–16	–
5	**Secondary Perennial Shrubs**			20–59	
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	2–12	–
	spiny hopsage	GRSP	*Grayia spinosa*	2–12	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	2–12	–
	bud sagebrush	PIDE4	*Picrothamnus desertorum*	2–12	–
	littleleaf horsebrush	TEGL	*Tetradymia glabrata*	2–12	–

Animal community

Livestock Interpretations:
This site is suited for livestock grazing. Grazing management should be keyed to Indian ricegrass and all other perennial grass production. 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. When actively growing, galleta provides good to excellent forage for cattle and horses and fair forage for domestic sheep. Although not preferred, all classes of livestock may use galleta when it is dry. Domestic sheep show greater use in winter than summer months and typically feed upon central portions of galleta tufts, leaving coarser growth around the edges. Galleta may prove somewhat coarse to domestic sheep. Desert needlegrass is palatable to livestock and is grazed during the spring. Bailey’s greasewood is an important winter browse plant for domestic sheep and cattle. It also receives light to moderate use by domestic sheep and cattle during spring and summer months. Greasewood contains soluble sodium and potassium oxalates that may cause poisoning and death in domestic sheep and cattle if large amounts are consumed in a short time. Shadscale is a valuable browse species, providing a source of palatable, nutritious forage for a wide variety of livestock. Shadscale provides good browse for domestic sheep. Shadscale leaves and seeds are an important component of domestic sheep and cattle winter diets. Nevada ephedra is important winter range browse for domestic cattle, sheep and goats.

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-greasewood vegetation provides valuable forage for livestock and wildlife, particularly during spring and summer before the hardening of spiny twigs. It supplies browse, seed, and cover for birds, small mammals, rabbits, deer, and pronghorn antelope.
Bailey’s greasewood is an important winter browse plant for big game animals and a food source for many other wildlife species. It also receives light to moderate use by mule deer and pronghorn during spring and summer months. Shadscale is a valuable browse species, providing a source of palatable, nutritious forage for a wide variety of wildlife particularly during spring and summer before the hardening of spiny twigs. It supplies browse, seed, and cover for birds, small mammals, rabbits, deer, and pronghorn antelope. Mule deer, bighorn sheep, and pronghorn browse Nevada ephedra, especially in spring and late summer when new growth is available. Indian ricegrass is eaten by pronghorn in "moderate" amounts whenever available. In Nevada it is consumed by desert bighorns. 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. In Nevada, Indian ricegrass may even dominate jackrabbit diets during the spring through early summer months. 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. Desert bighorn sheep of the Mojave Desert utilize galleta as forage. Galleta provides moderately palatable forage when actively growing and relatively unpalatable forage during dormant periods. Galleta provides poor cover for most wildlife species. Desert needlegrass is palatable to wildlife and is grazed during the spring.

Hydrological functions

Rills are rare on this site. A few can be expected on steeper slopes in areas subjected to summer convection storms or rapid snowmelt. Water flow patterns are often numerous in areas subjected to summer convection storms. Flow patterns are short and stable. Pedestals are rare and occurrence is usually limited to areas of water flow patterns. Frost heaving of shallow rooted plants should not be considered a normal condition. Gullies are rare in areas of this site that occur on stable landforms. Where this site occurs on inset fans, gullies and head cuts associated with ephemeral channel entrenchment may be common. Gullies and head cuts should be healing or stable. 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. Persistent litter (large woody material) will remain in place except during catastrophic events. Shrub canopy has little value in breaking raindrop impact. Medium to fine textured surface soils have moderate to high runoff and medium to slow infiltration rates. Very high amounts of surface rock fragments increase runoff potential, yet stabilize soil.

Recreational uses

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

Other products

The leaves, seeds and stems of greasewood are edible. Shadscale seeds were used by Native Americans of Arizona, Utah and Nevada for bread and mush. Native Americans used Nevada ephedra as a tea to treat stomach and kidney ailments. Indian ricegrass was traditionally eaten by some Native American peoples. The Paiutes used seed as a reserve food source.

Other information

Re-vegetation of shadscale communities is inherently difficult. Dry soil surfaces resulting from low humidity, high irradiation, and moderate to strong winds are major obstacles in re-vegetation projects. Nevada ephedra is useful for erosion control, and seedlings have been successfully planted onto reclaimed strip mines, with survival ranging from 12 to 94%. Atrazine may be effective in controlling Nevada ephedra, though some plants can survive through crown sprouting. Irrigation may increase control by atrazine.
Indian ricegrass is well-suited for surface erosion control and desert revegetation although it is not highly effective in controlling sand movement.

Inventory data references

NASIS soil component data.

Type locality

Location 1: Lyon County, NV	
Township/Range/Section	T18N R25E S13
General legal description	About 5 miles east of Silver Springs along graveled road leading south off USHwy 50, south end of Virginia Range, Lyon County, Nevada. This site also occurs in Churchill, Mineral and Pershing 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

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 none to 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:** Waterflow patterns are none to few and can be expected 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 waterflow patterns.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground ±25%

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 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. (This will be field tested.)

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is typically fine to very fine granular. Soil surface colors are light and are typified by an ochric epipedon. Organic
matter of the surface 2 to 3 inches is typically less than to 1 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:** Shrub canopy provide some protection from raindrop impact. Very high amounts of surface rock fragments increase runoff potential yet stabilize soil.

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. Subsoil argillic horizons or duripans are not to be interpreted as compacted layers.

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: Low-statured salt desert shrubs (shadscale & Bailey""s greasewood)> associated shrubs

    Sub-dominant: Deep-rooted, cool season, perennial bunchgrasses> > warm season, rhizomatous perennial grasses>deep-rooted, cool season, perennial forbs>fibrous, shallow-rooted, cool season, annual and perennial forbs > shallow-rooted, warm season perennial bunchgrasses

    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 common and standing dead shrub canopy material may be as much as 30% of total woody canopy; mature bunchgrasses commonly have dead centers.

14. **Average percent litter cover (%) and depth (in):** Reference Plant Community: Fine litter between plant interspaces and under canopy (10-15%) 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 May) ± 350 lbs/ac; Favorable years ± 500 lbs/ac; Unfavorable years ± 200 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 during extended or extreme drought conditions.