

## Ecological site R029XY080NV SHALLOW SANDY LOAM 5-8 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.

### Associated sites

R029XY031NV	<b>SHALLOW DROUGHTY LOAM 5-8 P.Z.</b>
R029XY077NV	<b>SHALLOW GRAVELLY LOAM 8-10 P.Z.</b>
R029XY079NV	<b>DROUGHTY LOAM 5-8 P.Z.</b>

### Similar sites

R029XY034NV	<b>SANDY 3-5 P.Z.</b> ACHY dominant plant; MESP2 absent
R029XY012NV	<b>SANDY 5-8 P.Z.</b> ACHY dominant plant; MESP2 rare to absent
R029XY046NV	<b>SANDY LOAM 5-8 P.Z.</b> ATCA2-KRLA2 codominant shrubs; MESP2 rare to absent
R029XY074NV	<b>SHALLOW LOAM 5-8 P.Z.</b> MESP2-ATCO codominant shrubs
R029XY031NV	<b>SHALLOW DROUGHTY LOAM 5-8 P.Z.</b> GRSP-MESP2 codominant

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Atriplex canescens</i> (2) <i>Menodora spinescens</i>
Herbaceous	(1) <i>Achnatherum hymenoides</i>

### Physiographic features

This site occurs on fan piedmonts. Slopes range from 2 to 8 percent, but slope gradients of 4 to 8 are most typical. Elevation are 3900 to 4500 feet.

**Table 2. Representative physiographic features**

Landforms	(1) Fan piedmont
Elevation	3,900–4,500 ft
Slope	2–8%
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 5 to 8 inches. Mean annual air temperature is 52 to 58 degrees F. The average growing season is about 140 to 200 days.

Table 3. Representative climatic features

Frost-free period (average)	20 days
Freeze-free period (average)	0 days
Precipitation total (average)	8 in

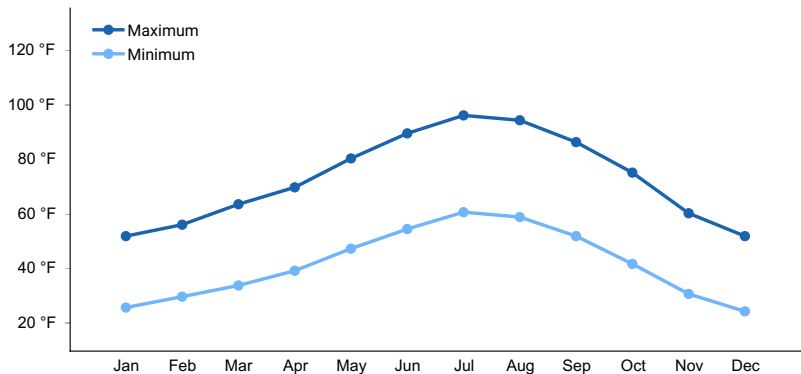


Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are shallow over a petrocalcic and well drained. These soils have moderately rapid permeability and have very low available water capacity. The soils are moderately to strongly alkaline affected throughout the profile. Sheet and rill erosion potential is moderate. The soil series associated with this site is Crystal Springs classified as a Loamy, carbonatic, mesic, shallow Typic Petrocalcic.

Table 4. Representative soil features

Parent material	(1) Alluvium–limestone (2) Alluvium–dolomite
Surface texture	(1) Very gravelly sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately rapid
Soil depth	14–20 in
Surface fragment cover <=3"	15–25%
Surface fragment cover >3"	2–3%
Available water capacity (0-40in)	1.4–1.5 in
Calcium carbonate equivalent (0-40in)	15–40%

Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–5
Soil reaction (1:1 water) (0-40in)	8.5–9
Subsurface fragment volume <=3" (Depth not specified)	19–25%
Subsurface fragment volume >3" (Depth not specified)	2–3%

## Ecological dynamics

Where management results in abusive grazing use by cattle and/or feral horses, fourwing saltbush and Indian ricegrass decrease. With continued site deterioration spiny menodora, Nevada ephedra and other preferred forage species will decrease while threadleaf snakeweed, Anderson's wolfberry and horsebrush become dominant. Species likely to invade this site are annual forbs and grasses such as cheatgrass.

### Fire Ecology:

The mean fire return interval for salt-desert shrub communities range from 35 to 100 years. 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. Fire top-kills or kills fourwing saltbrsh, depending upon ecotype. Fourwing saltbush may sprout after top-kill. Spiny menodora often survives fire because its foliage does not readily burn. 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. Fire typically destroys aboveground parts of Anderson wolfberry, but the degree of damage to the plant depends on fire severity. 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. 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. 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. Galleta is a rhizomatous perennial which can resprout after top-kill by fire.

## State and transition model

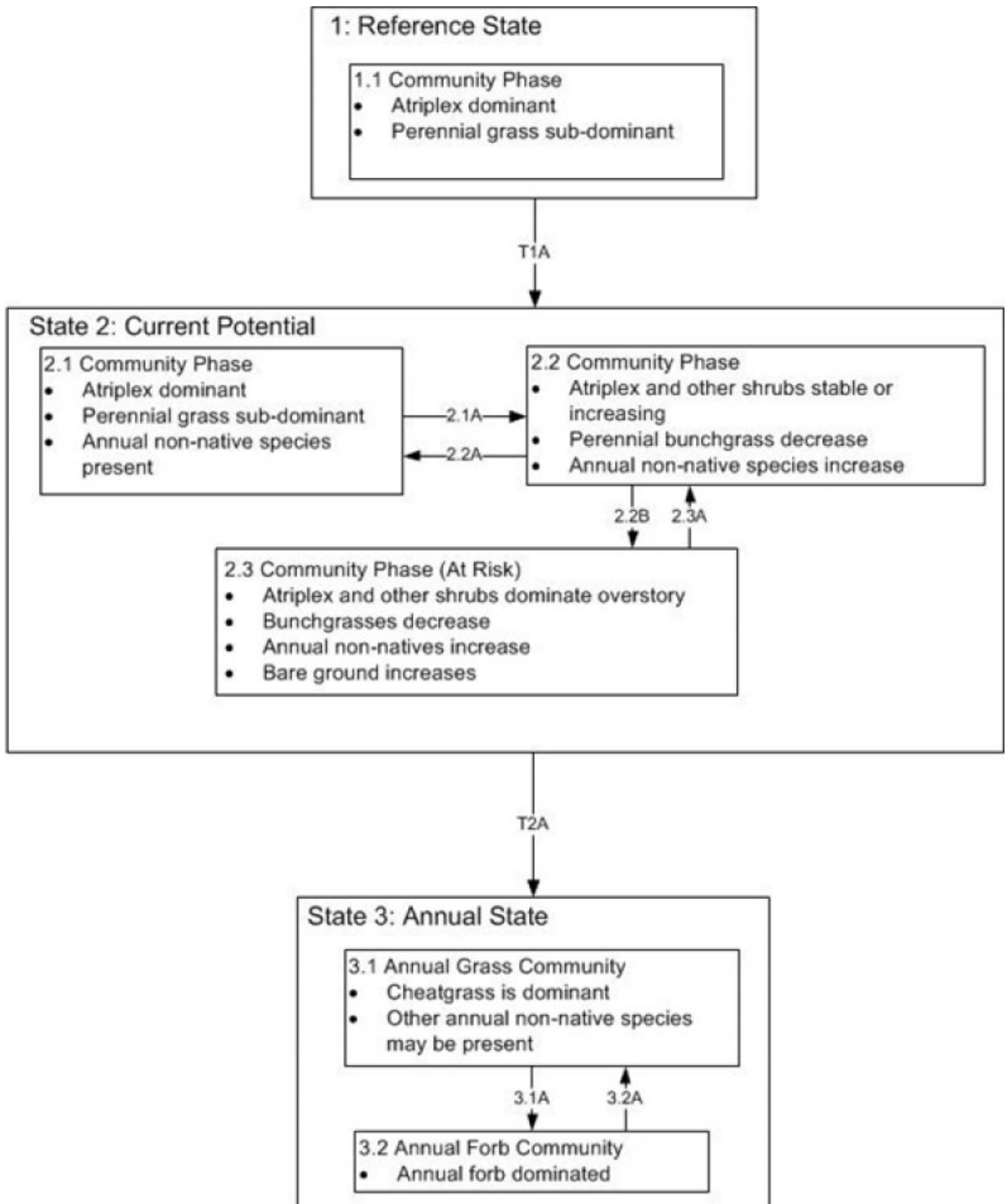


Figure 2. DRAFT STM

## State 1 Reference State

### Community 1.1 Reference Plant Community

The reference plant community is dominated by fourwing saltbush, spiny menodora, Nevada ephedra and Indian

ricegrass. Potential vegetative composition is about 40% grasses, 10% perennial and annual forbs and 50% shrubs. Approximate ground cover (basal and crown) is 15 to 25 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	125	200	300
Grass/Grasslike	100	160	240
Forb	25	40	60
Total	250	400	600

State 2  
Current Potential State

State 3  
Annual State

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Primary Perennial Grasses</b>			137–220	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	120–160	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	8–20	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	8–20	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	1–20	–
2	<b>Secondary Perennial Grasses</b>			8–32	
	purple threeawn	ARPU9	<i>Aristida purpurea</i>	2–12	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	2–12	–
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	2–12	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	2–12	–
<b>Forb</b>					
3	<b>Perennial</b>			16–48	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	0–20	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	8–16	–
4	<b>Annual</b>			1–12	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	120–160	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	8–20	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	8–20	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	2–14	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	2–14	–
<b>Shrub/Vine</b>					
5	<b>Primary Shrubs</b>			128–236	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	60–100	–
	spiny menodora	MESP2	<i>Menodora spinescens</i>	40–80	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	20–40	–
	water jacket	LYAN	<i>Lycium andersonii</i>	8–16	–
6	<b>Secondary Shrubs</b>			8–40	
	Shockley's goldenhead	ACSH	<i>Acamptopappus shockleyi</i>	4–12	–
	yellow rabbitbrush	CHV18	<i>Chrysothamnus viscidiflorus</i>	4–12	–
	threadleaf snakeweed	GUMI	<i>Gutierrezia microcephala</i>	4–12	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	4–12	–
	desert pepperweed	LEFR2	<i>Lepidium fremontii</i>	4–12	–
	bud sagebrush	PIDE4	<i>Picrothamnus desertorum</i>	4–12	–
	littleleaf horsebrush	TEGL	<i>Tetradymia glabrata</i>	4–12	–

## Animal community

### Livestock Interpretations:

This site is suited for livestock grazing. Grazing management should be keyed to perennial grass production. Indian ricegrass has good forage value for domestic sheep, cattle and horses. It supplies a source of green feed before most other native grasses have produced much new growth. Young desert needlegrass is palatable to all classes of livestock. Mature herbage is moderately grazed by horses and cattle, but rarely grazed by sheep. 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. 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. Fourwing saltbush is one of the most palatable shrubs in the West. Its protein, fat, and carbohydrate levels are comparable to alfalfa. It provides nutritious forage for all classes of livestock. Palatability is rated as good for domestic sheep and domestic goats; fair for cattle; fair to good for horses in winter, poor for horses in other seasons. Spiny menodora has lower palatability than the other shrubs but is consumed during early spring before spines mature. Nevada ephedra is important winter range browse for domestic cattle, sheep and goats. Anderson wolfberry is sometimes used as forage by livestock. Palatability of Anderson wolfberry browse is presumably fair to low. This species is used as forage only when more desirable species are unavailable. The fruit, however, appears to be moderately palatable.

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:

Fourwing saltbush provides valuable habitat and year-round browse for wildlife. Fourwing saltbush also provides browse and shelter for small mammals. Additionally, the browse provides a source of water for black-tailed jackrabbits in arid environments. Granivorous birds, consume the fruits. Wild ungulates, rodent and lagomorphi readily consume all aboveground portions of the plant. Palatability is rated good for deer, elk, pronghorn and bighorn sheep. Spiny menodora has lower palatability than the other shrubs but is consumed during early spring before spines mature. Mule deer, bighorn sheep, and pronghorn browse Nevada ephedra, especially in spring and late summer when new growth is available. Palatability of Anderson wolfberry browse is presumably fair to low. This species is used as forage only when more desirable species are unavailable. The fruit, however, appears to be moderately palatable. Anderson wolfberry is sometimes used as forage by feral burros. The red berries are eaten by some birds and mammals. Berries of this plant constituted 2 percent of the diet of chukar partridges. In some areas of southern Nevada, the fleshy leaves and juicy berries provide part of the succulence permitting Gambel quail to occupy desert areas devoid of drinking water. In desert washes Anderson wolfberry grows in dense thorny thickets which provide good cover for quail and other small wildlife. 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. 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. Bottlebrush squirreltail is a dietary component of several wildlife species. Galleta provides moderately palatable forage when actively growing and relatively unpalatable forage during dormant periods. Galleta provides poor cover for most wildlife species.

## Hydrological functions

Runoff is very high. 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

Fourwing saltbush is traditionally important to Native Americans. They ground the seeds for flour. The leaves, placed on coals, impart a salty flavor to corn and other roasted food. Top-growth produces a yellow dye. Young leaves and shoots were used to dye wool and other materials. The roots and flowers were ground to soothe insect bites. Native Americans used the fleshy berries of Anderson wolfberry either fresh or boiled and then dried them for later use. This shrub is also used as an ornamental valued chiefly for its showy red berries. 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

Fourwing saltbush is widely used in rangeland and riparian improvement and reclamation projects, including burned area recovery. It is probably the most widely used shrub for restoration of winter ranges and mined land reclamation. 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. Bottlebrush squirreltail is tolerant of disturbance and is a suitable species for revegetation.

## Type locality

Location 1: Lincoln County, NV	
Township/Range/Section	T3S R61E S35
Latitude	37° 38' 35"
Longitude	115° 6' 33"
General legal description	Section 35, T3S. R61E. MDBM. Sixmile Flat area, about 4½ miles north of USHwy 93. Follow dirt road leading past fenced exclosure, then west for approximately ¾ mile. Lincoln County, Nevada.

## Other references

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

USDA-NRCS Plants Database (Online; <http://www.plants.usda.gov>)

## Contributors

RRK

## 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	11/01/2016
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** Rills are not expected on this site.
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2. **Presence of water flow patterns:** Water flow patterns none to rare. A few, short (<1 m) and meandering may occur on steeper slopes after summer convection storms.
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3. **Number and height of erosional pedestals or terracettes:** Pedestals and terracettes are none to rare. Occurrence is limited to water flow paths.
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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  $\pm$  50%, depending on amount of rock fragments.
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5. **Number of gullies and erosion associated with gullies:** None
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Typically none – with surface disturbance some localized wind-scouring may occur.
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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) expected to move distance of slope length (< 3 m) during intense summer storms. Persistent litter (large woody material) will remain in place except during large rainfall events.
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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 the moderately coarse soil textures typically found on this site.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is slightly hard, moderate thick platy. Soil surface colors are pale browns and soils are typified by an ochric epipedon. Organic matter of the surface 2 to 3 inches is typically less than 1 percent. 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 perennial grasses [i.e. 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. Subsoil petrocalcic horizons should not be mistaken for 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: Reference State: Salt-desert deciduous shrubs (i.e., fourwing saltbush, spiny menodora) > deep-rooted, cool season, perennial bunchgrasses>>

Sub-dominant: associated shrubs > deep-rooted perennial forbs > warm season, rhizomatous perennial grasses >> warm season, perennial bunchgrasses > shallow-rooted, cool season, annual forbs.

Other: succulents, microbiotic crusts

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** ead 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 ( $\pm 20\%$ ) have dead centers.
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14. **Average percent litter cover (%) and depth ( in):** Between plant interspaces (15-20%) and depth of litter is  $< \frac{1}{4}$  inch
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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-June)  $\pm 400$  lbs/ac; Favorable years  $\pm 600$  lbs/ac; unfavorable years  $\pm 250$  lbs/ac. Late summer moisture affects production of warm season grasses
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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 on this site include red brome, cheatgrass, Russian thistle, and annual mustards.
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17. **Perennial plant reproductive capability:** All functional groups should reproduce in average (or normal) and above average growing season years. Little to no growth or reproduction occurs during years of extreme drought conditions.
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