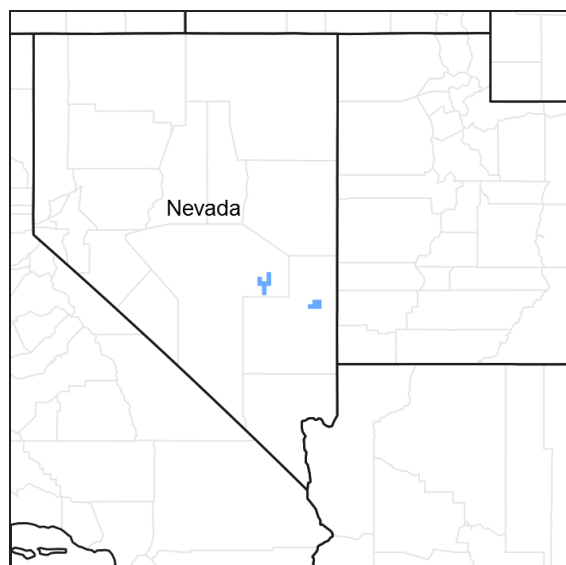


## Ecological site R029XY170NV SHALLOW CALCAREOUS LOAM 10-12

Accessed: 05/13/2025

### 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.



**Figure 1. Mapped extent**

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

### Associated sites

R029XY008NV	<b>SHALLOW CALCAREOUS LOAM 8-12 P.Z.</b>
R029XY009NV	<b>UPLAND WASH</b>
R029XY029NV	<b>LOAMY 10-12 P.Z.</b>

### Similar sites

R029XY008NV	<b>SHALLOW CALCAREOUS LOAM 8-12 P.Z.</b> PUST and PERA4 minor species.
R029XY028NV	<b>SHALLOW CALCAREOUS SLOPE 12-14 P.Z.</b> PSSPI dominant grass
R029XY104NV	<b>SHALLOW CLAY LOAM 10-12 P.Z.</b> ACTH7 codominant grass
R029XY014NV	<b>SHALLOW CALCAREOUS SLOPE 8-12 P.Z.</b> Less productive site, occurs on steeper slopes
R029XY099NV	<b>STONY CALCAREOUS HILL</b> Less productive site, BEFR codominant shrub

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Artemisia nova</i> (2) <i>Purshia stansburiana</i>
Herbaceous	(1) <i>Achnatherum hymenoides</i>

## Physiographic features

This site occurs on fan remnants on all exposures. Slopes range from 2 to 30 percent, but slopes of 2 to 15 percent are most typical. Elevations are from 5800 to about 7300 feet.

**Table 2. Representative physiographic features**

Landforms	(1) Fan remnant
Elevation	1,768–2,225 m
Slope	2–30%
Aspect	Aspect is not a significant factor

## Climatic features

The climate associated with this site is semiarid with cool, moist winters and hot, dry summers. The mean annual precipitation is 10 to 14 inches, most falling as rain during the winter months. Additional moisture occurs from July through September in the form of intense, convective storms. Mean annual temperature is 50 to 55 degrees. The average growing season is 100 to 120 days.

**Table 3. Representative climatic features**

Frost-free period (average)	120 days
Freeze-free period (average)	0 days
Precipitation total (average)	356 mm

## Influencing water features

There are no influencing water features associated with this site.

## Soil features

The soils are shallow to an indurated duripan. These soils are well drained and formed in mixed alluvium dominantly from quartzite, limestone, and lacustrine sediments. These soils are medium textured and have high amounts of rock fragments throughout the profile. Soil reaction is moderately to strongly alkaline. The soils have a mollic epipedon. Soil series correlated to this site include Jarab.

**Table 4. Representative soil features**

Surface texture	(1) Cobbly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow to very slow
Soil depth	25–51 cm
Surface fragment cover ≤3"	25–35%
Surface fragment cover >3"	25–35%

Available water capacity (0-101.6cm)	3.56–3.81 cm
Calcium carbonate equivalent (0-101.6cm)	5–15%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	35–50%
Subsurface fragment volume >3" (Depth not specified)	0%

## Ecological dynamics

As ecological condition declines black sagebrush, rabbitbrush, bottlebrush squirreltail and galleta increase while Indian ricegrass, and needleandthread decrease. Cheatgrass readily invades this site. Utah juniper and singleleaf pinyon readily increase on this site where it occurs adjacent to forest areas. If tree canopies are allowed too close, they can eliminate understory vegetation. Following wildfire, wild crabapple and Stansbury cliffrose will increase to varying degrees depending upon fire intensity.

### Fire Ecology:

Black sagebrush communities generally lack enough fine fuels to carry a fire. In addition to low fine fuel loading, wide shrub spacing makes fire infrequent or difficult to prescribe in black sagebrush types. Black sagebrush is highly susceptible to fire-caused mortality; plants are readily killed by all fire intensities. Following burning, reestablishment occurs through off-site sources. Fire effects on Stansbury cliffrose are variable. Fire may kill or severely damage plants. Late-season fire also increases the risk of mortality. Stansbury cliffrose is a weak sprouter that is generally killed by severe fire. 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. Needleandthread grass is top-killed by fire. It may be killed if the aboveground stems are completely consumed. Needleandthread grass is classified as slightly to severely damaged by fire. Needleandthread grass sprouts from the caudex following fire, if heat has not been sufficient to kill underground parts. Recovery usually takes 2 to 10 years.

## State and transition model

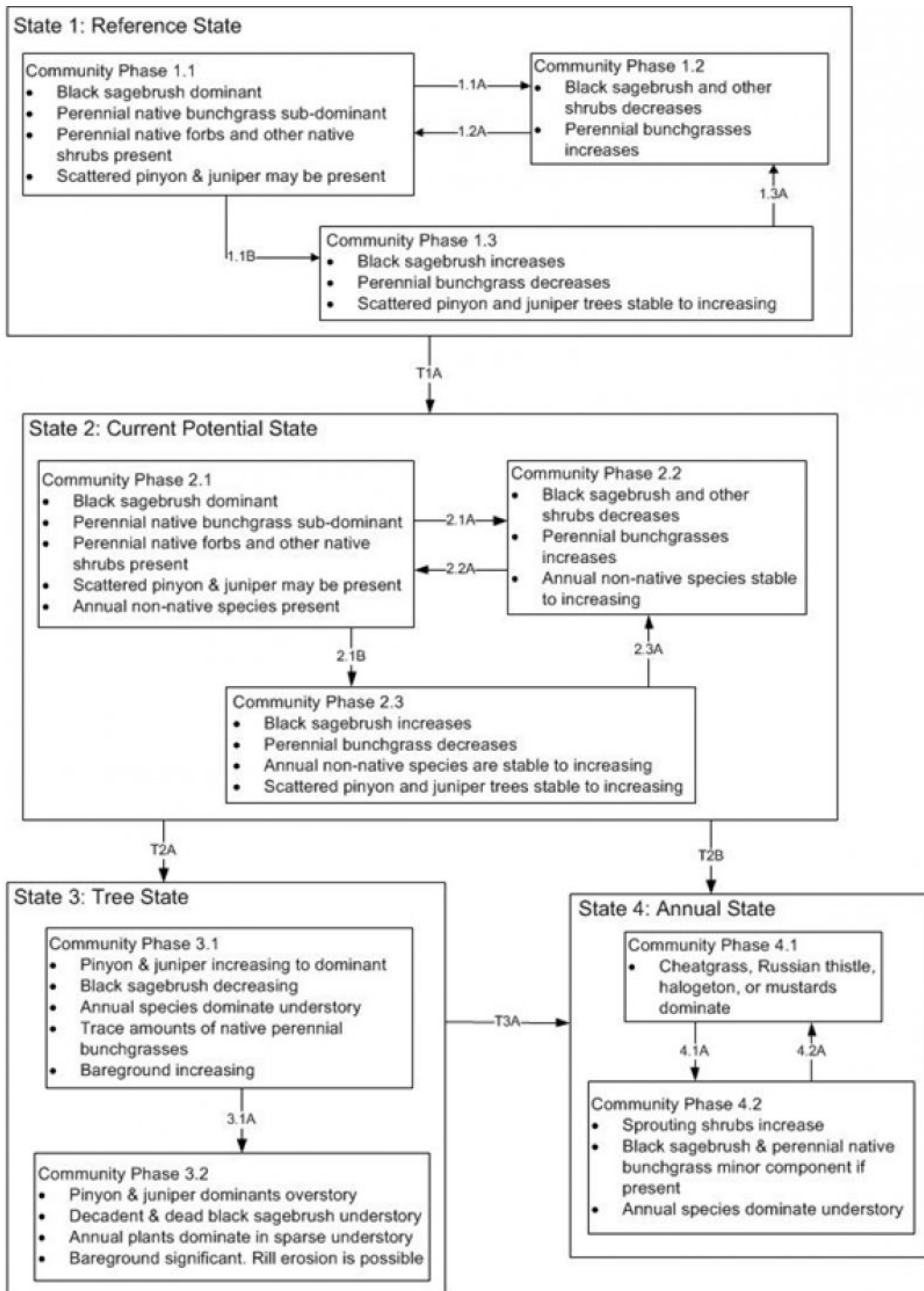


Figure 3. DRAFT STM

<p>State 1: Representative of the reference conditions prior to Euro-American settlement in the west.</p> <p>1.1A: fire or other disturbance that removes sagebrush canopy</p> <p>1.1B: absence of disturbance and natural regeneration over time</p> <p>1.2A: absence of disturbance and natural regeneration over time</p> <p>1.3A: fire or other disturbance that removes sagebrush canopy</p> <p>T1A: introduction of non-native species</p> <p>State 2: Representative of the current potential with the presence of non-native annuals. Non-native annuals have the ability to significantly change disturbance regimes and nutrient cycling dynamics.</p> <p>2.1A: fire or other disturbance that removes sagebrush canopy</p> <p>2.1B: absence of disturbance and natural regeneration over time, may be coupled with inadequate rest and recovery from defoliation</p> <p>2.2A: absence of disturbance and natural regeneration over time</p> <p>2.3A: fire or other disturbance that removes sagebrush canopy</p> <p>T2A: long term absence of fire and natural regeneration of pinyon &amp; juniper trees</p> <p>T2B: reoccurring severe fire</p> <p>State 3: Dominated by pinyon and/or juniper trees. Changes in disturbance return intervals over the long term allows for pinyon and/or juniper to dominate the site by controlling site resources.</p> <p>3.1A: absence of disturbance and natural regeneration over time</p> <p>T3A: reoccurring severe fire</p> <p>State 4: Dominated by non-native annuals. Changes in disturbance return intervals and nutrient dynamics creating a positive feedback loop.</p> <p>4.1A: absence of disturbance and natural regeneration over time</p> <p>4.2A: fire or other disturbance that removed shrub canopy</p>
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Figure 4. DRAFT STM LEGEND

State 1  
Reference State

Community 1.1  
Reference Plant Community

The reference plant community is dominated by black sagebrush, Stansbury cliffrose and Indian ricegrass. Potential vegetative composition is approximately 40% grasses, 10% forbs and 50% shrubs and trees. Approximate ground cover (basal and crown) is 20 to 30 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	232	309	387
Grass/Grasslike	202	269	336
Forb	50	67	84
Tree	20	27	34
Total	504	672	841

State 2  
Current Potential State

State 3  
Tree State

State 4  
Annual State

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Primary Perennial Grasses</b>			202–303	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	135–202	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	67–101	–
2	<b>Secondary Perennial Grasses</b>			20–54	
	purple threeawn	ARPUP6	<i>Aristida purpurea</i> var. <i>purpurea</i>	3–20	–
	squirreltail	ELELE	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	3–20	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	3–20	–
	muttongrass	POFE	<i>Poa fendleriana</i>	3–20	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	3–20	–
3	<b>Annual Grasses</b>			1–7	
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	1–7	–
<b>Forb</b>					
4	<b>Perennial</b>			34–67	
	milkvetch	ASTRA	<i>Astragalus</i>	3–13	–
	Hooker's balsamroot	BAHO	<i>Balsamorhiza hookeri</i>	3–13	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	3–13	–
	matted buckwheat	ERCA8	<i>Eriogonum caespitosum</i>	3–13	–
	desert frasera	FRAL5	<i>Frasera albomarginata</i>	3–13	–
	rubberweed	HYMEN7	<i>Hymenoxys</i>	3–13	–
	phlox	PHLOX	<i>Phlox</i>	3–13	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	3–13	–
5	<b>Annual</b>			1–34	
	buckwheat	ERIOG	<i>Eriogonum</i>	1–13	–
<b>Shrub/Vine</b>					
6	<b>Primary Shrubs</b>			235–404	
	black sagebrush	ARNO4	<i>Artemisia nova</i>	168–235	–
	Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>	34–101	–
	wild crab apple	PERA4	<i>Peraphyllum ramosissimum</i>	34–67	–
7	<b>Secondary Shrubs</b>			34–101	
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	3–13	–
	Whipple cholla	CYWH	<i>Cylindropuntia whipplei</i>	3–13	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	3–13	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	3–13	–
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	3–13	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	3–13	–
	horsebrush	TETRA3	<i>Tetradymia</i>	3–13	–
	yucca	YUCCA	<i>Yucca</i>	3–13	–
<b>Tree</b>					
8	<b>Evergreen</b>			20–34	
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	3–17	–
	singleleaf pinyon	PIMO	<i>Pinus monophylla</i>	3–17	–

## **Animal community**

### **Livestock Interpretations:**

This site is suitable for livestock grazing. Grazing management should be keyed to Indian ricegrass, needleandthread grass, and other perennial grass species. 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. Needleandthread provides highly palatable forage, especially in the spring before fruits have developed. Needlegrasses are grazed in the fall only if the fruits are softened by rain. In winter, at lower elevations, black sagebrush is heavily utilized by domestic sheep. Stansbury cliffrose is an important browse species for livestock, especially in the winter. Livestock also browse squaw-apple, and opinions vary widely on its forage value. It is considered poor to moderately good sheep and cattle browse in the spring. On ranges grazed by cattle during late winter and very early spring, individual plants may be severely hedged.

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:**

Black sagebrush is a significant browse species within the Intermountain region. It is especially important on low elevation winter ranges in the southern Great Basin, where extended snow free periods allow animal's access to plants throughout most of the winter. In these areas it is heavily utilized by pronghorn and mule deer. Sagebrush-grassland communities provide critical sage-grouse breeding and nesting habitats. Sagebrush is a crucial component of their diet year-round, and sage-grouse select sagebrush almost exclusively for cover. Sage-grouse prefer mountain big sagebrush and Wyoming big sagebrush communities to basin big sagebrush communities. Stansbury cliffrose is an important browse species for mule deer, pronghorn, game birds, and songbirds. Wild ungulates use it heavily in winter. Wildlife known to eat squaw-apple fruits and seeds include grouse and wild turkeys, deer mice, chipmunks, and ground squirrels. Deer browse squaw-apple lightly during the fall and winter, and small birds use the intricately branched shrubs as cover even when leaves are not present. 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. Needleandthread is moderately important spring forage for mule deer, but use declines considerably as more preferred forages become available.

## **Recreational uses**

Aesthetic value is derived from the diverse floral and faunal composition and the colorful flowering of wild flowers and shrubs during the spring and early summer. This site offers rewarding opportunities to photographers and for nature study. This site is used for camping and hiking and has potential for upland and big game hunting.

## **Other products**

Indian ricegrass was traditionally eaten by some Native Americans. The Paiutes used seed as a reserve food source. Triterpenoids extracted from Stansbury cliffrose have been shown to have inhibitory effects on HIV and Epstein-Barr virus. Native Americans used the inner bark for making clothing and ropes, and the branches for making arrows.

## **Other information**

Needleandthread grass is useful for stabilizing eroded or degraded sites. Black sagebrush is an excellent species to establish on sites where management objectives include restoration or improvement of domestic sheep, pronghorn, or mule deer winter range. Stansbury cliffrose is recommended for wildlife, roadside, construction, and mine spoils plantings; and for restoring pinyon-juniper woodland, mountain brushland, basin big sagebrush grassland, black sagebrush, and black greasewood communities. It can be established on disturbed seedbeds by broadcast seeding,



drill seeding, or transplanting. Fall or winter seeding is recommended. Even though squaw-apple grows slowly, it can persist in native plant landscaping for arid environments.

## Type locality

Location 1: Lincoln County, NV	
Township/Range/Section	T1N R67E S7
UTM zone	N
UTM northing	4204823
UTM easting	0717902
General legal description	Approximately 4.5 miles northwest of Pioche, 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

CJ ANDERSON

## 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	05/16/2013
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** Rills are none to rare. A few can 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 none to rare (short <1 m and stable) and can be expected in areas subjected to summer convection storms or rapid snowmelt.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals are none to rare. Occurrence is usually limited to areas of water flow patterns.

- 
4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground 15-30% depending on amount of surface rock fragments.
- 
5. **Number of gullies and erosion associated with gullies:** None
- 
6. **Extent of wind scoured, blowouts and/or depositional areas:** None
- 
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 3 to 6 for most surface soil textures found on this site. (To be field tested.)
- 
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is typically thin to thick platy. Soil surface colors are browns and soils are typified by a thin mollic epipedon. Organic matter of the surface 2 to 3 inches is typically 1 to 1.5 percent dropping off quickly below. Organic matter content can be more or less depending on micro-topography.
- 
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial herbaceous plants (especially deep-rooted bunchgrasses [i.e., needleandthread & Indian ricegrass] slow runoff and increase infiltration. Shrub canopy and associated litter break raindrop impact.
- 
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 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: Deep-rooted, cool season, perennial bunchgrasses (needleandthread & Indian ricegrass) = evergreen shrubs (black sagebrush, cliffrose)
- Sub-dominant: associated shrubs > shallow-rooted and rhizomatous, cool season, perennial bunchgrasses > deep-rooted, cool season, perennial forbs = fibrous, shallow-rooted, cool season, perennial and annual forbs
- Other: succulents, evergreen trees
- 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 20% of total woody canopy; some of the mature bunchgrasses (<10%) have dead centers.
- 
14. **Average percent litter cover (%) and depth ( in):** Within plant interspaces (15-25%) 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 (through mid-June) ± 600 lbs/ac. Favorable years ~750 lbs/ac and unfavorable years ~450 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, annual mustards, halogeton and Russian thistle. Utah juniper and singleleaf pinyon may increase and dominate this site.
- 
17. **Perennial plant reproductive capability:** All functional groups should reproduce in average (or normal) and above average growing season years. Little growth or reproduction occurs in extreme drought years.
-