USDA Natural Resources
Conservation Service

Ecological site R029XY168NV
SHALLOW ERODED SLOPE 8-10

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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.

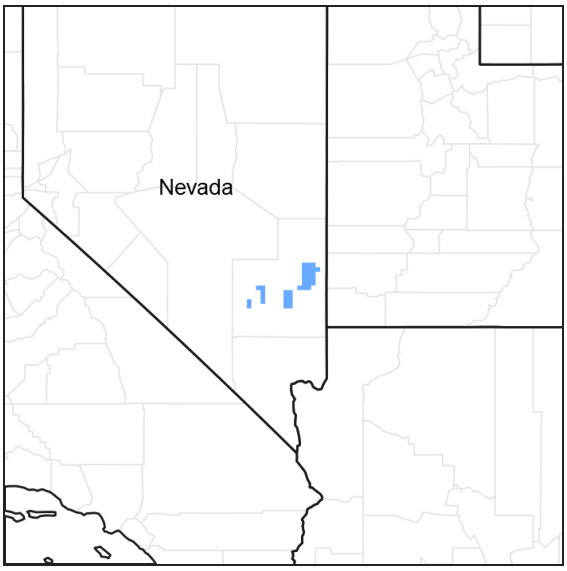

Figure 1. Mapped extent

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	**SHALLOW CALCAREOUS LOAM 8-12 P.Z.**
R029XY009NV	**UPLAND WASH**
R029XY012NV	**SANDY 5-8 P.Z.**
R029XY014NV	**SHALLOW CALCAREOUS SLOPE 8-12 P.Z.**
R029XY015NV	**SHALLOW CALCAREOUS HILL 8-10 P.Z.**
R029XY167NV	**GRAVELLY LOAM 8-10 P.Z.**

Similar sites

R029XY006NV	**LOAMY 8-10 P.Z.** more productive site
R029XY015NV	**SHALLOW CALCAREOUS HILL 8-10 P.Z.** PUST and JUOS major species

Table 1. Dominant plant species

Tree	Not specified

Shrub	(1) *Gutierrezia sarothrae* (2) *Artemisia nova*
Herbaceous	(1) *Pleuraphis jamesii*

Physiographic features

This site occurs on pediment remnants on all exposures. Slopes range from 15 to 75 percent, but slope gradients of 30 to 50 percent are typical. Elevations are 4500 to about 6000 feet.

Table 2. Representative physiographic features

Landforms	(1) Pediment
Elevation	1,372–1,829 m
Slope	15–75%
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 8 to 10 inches. Moisture in the form of intermittent convection storms provides an important source of precipitation from July through September. Mean annual air temperature is 53 to 55 degrees F. The average growing season is about 110 to 150 days.
There is no climate station associated with this site.

Table 3. Representative climatic features

Frost-free period (average)	150 days
Freeze-free period (average)	0 days
Precipitation total (average)	254 mm

Influencing water features

This site recieves moisture in the form of intermittent convection storms provides an important source of precipitation from July through September.

Soil features

Soils associated with this site are very shallow and well drained. Surface soils are medium textured and normally less than 6 to 10 inches thick to underlying material, commonly lacustrine deposits. Because of steep slopes and sparse vegetation, the soils of this site are subject to sheet and rill erosion. The available water capacity is low. Runoff is very high.

Ecological dynamics

Livestock use of this site is minimized by steep slopes and low productivity. Plant community alterations occur primarily by natural disturbances such as, drought, insects, erosion and fire. Soil erosion resulting from unstable soils on steep slopes impacts species composition and reduces productivity. Species adapted to survive in disturbed conditions such as broom snakeweed dominate this site. Utah juniper may increase on this site. A significant increase in tree density is hindered by surface soil instability and loss of the root zone due to erosion.

Fire Ecology:
Broom snakeweed is a fire-intolerant species that is severely harmed or, more often, killed by fire. Plants sometimes sprout but are more typically killed by fire. Reestablishment proceeds rapidly through light, wind-dispersed seed from adjacent unburned areas. The density of broom snakeweed often increases after fire. Seeds

can remain viable in the soil, unharmed by fire, and can germinate immediately after fire or in subsequent years. Broom snakeweed may be completely removed from an area immediately after fire. 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. 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. Galleta is a rhizomatous perennial which can resprout after top-kill by 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.

State and transition model

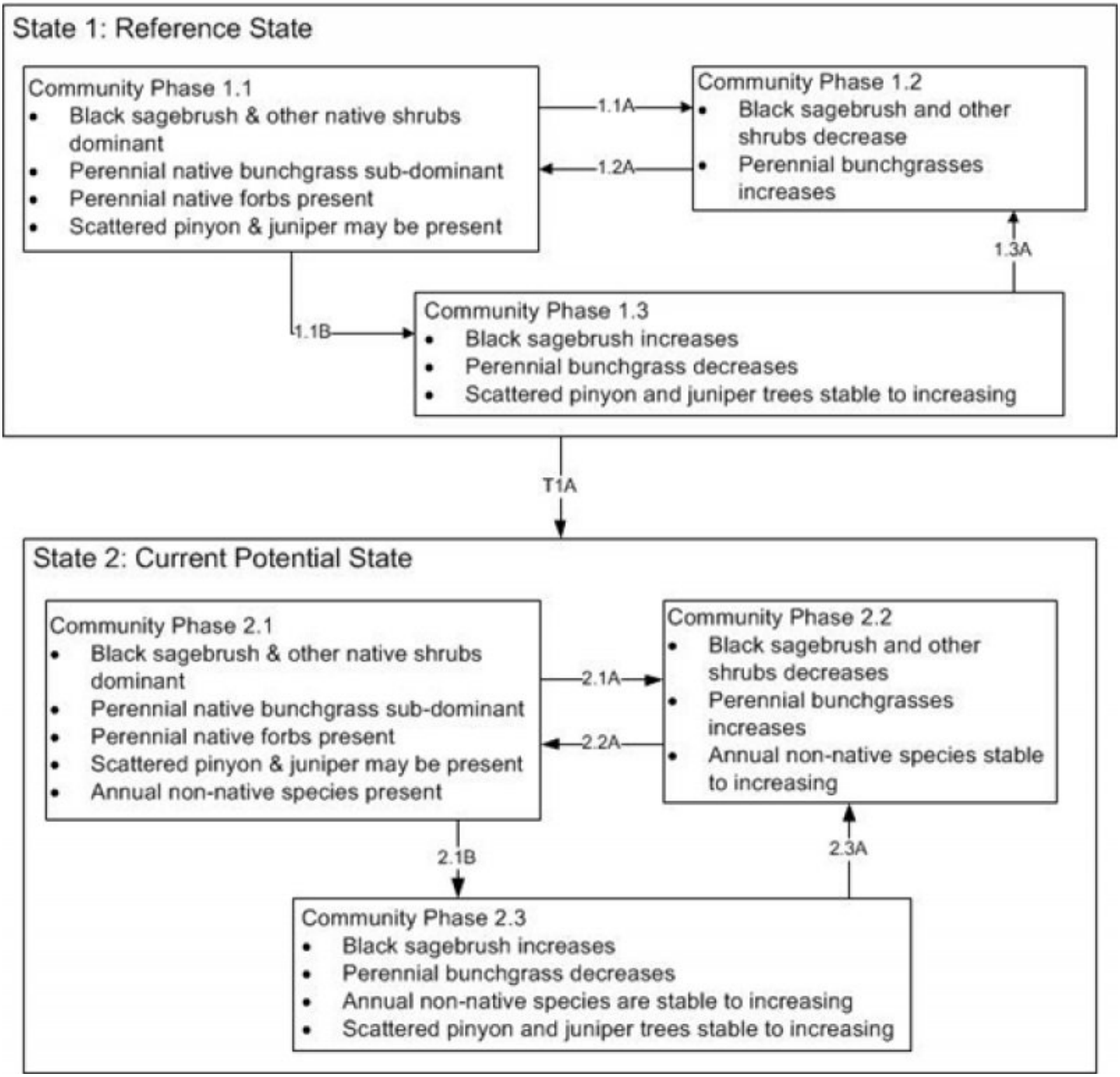

Figure 3. DRAFT STM

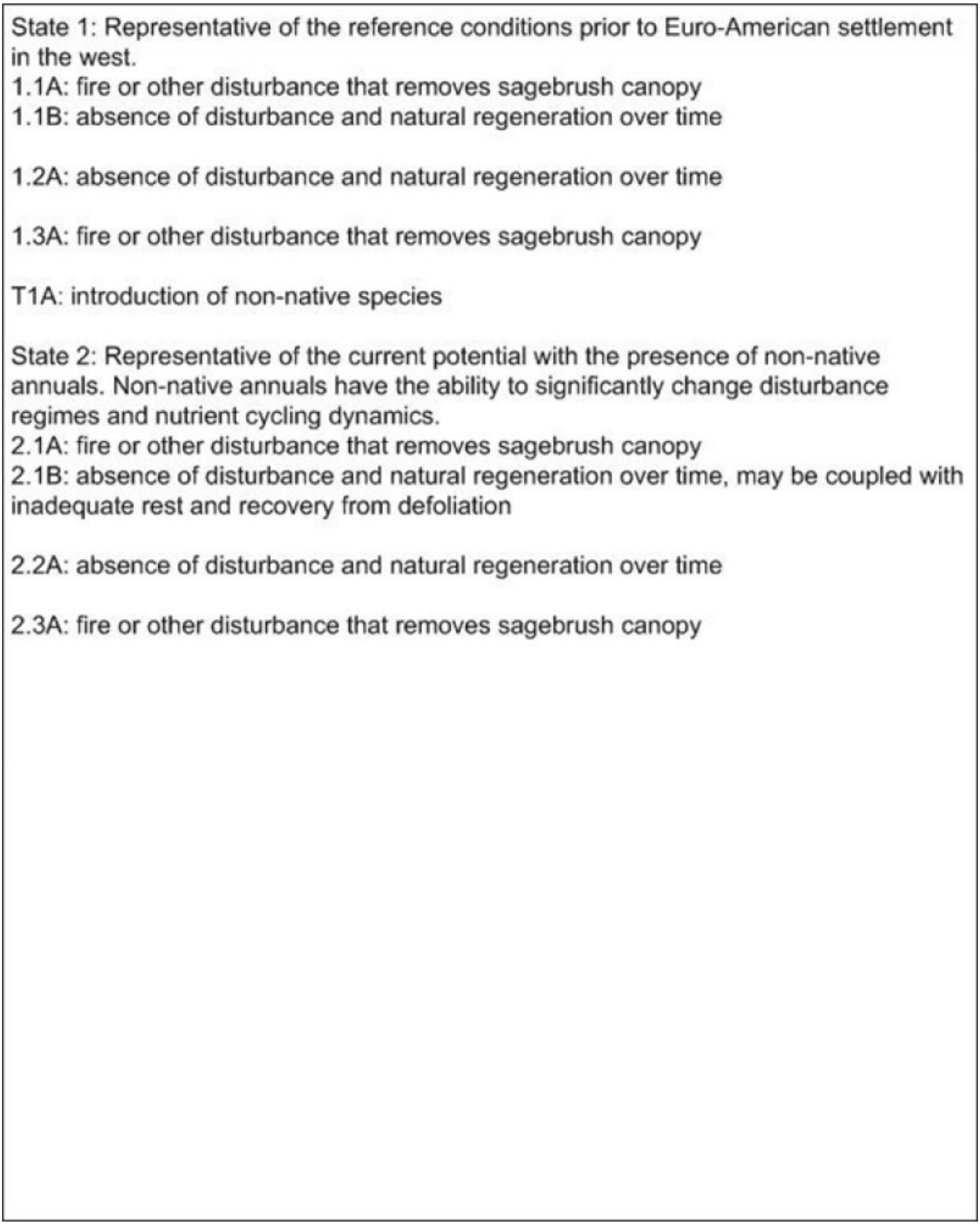

Figure 4. DRAFT STM LEGEND

State 1
Reference State

Community 1.1
Reference Plant Community

The reference plant community is dominated by broom snakeweed, black sagebrush galleta and indian ricegrass. Potential vegetative composition is approximately 30% grasses, 10% forbs and 60% shrubs and trees. Approximate ground cover (basal and crown)is 25 to 30 percent.

Table 4. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	50	84	135
Grass/Grasslike	25	43	67
Forb	8	15	22
Total	**83**	**142**	**224**

State 2
Current Potential State

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Primary Perennial Grasses**			21–36	
	James' galleta	PLJA	*Pleuraphis jamesii*	13–22	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	8–13	–
2	**Secondary Perennial Grasses**			2–7	
	purple threeawn	ARPUP6	*Aristida purpurea var. purpurea*	1–3	–
	blue grama	BOGR2	*Bouteloua gracilis*	1–3	–
	squirreltail	ELEL5	*Elymus elymoides*	1–3	–
	needle and thread	HECO26	*Hesperostipa comata*	1–3	–
3	**Annual Grasses**			1–4	
	sixweeks fescue	VUOC	*Vulpia octoflora*	1–3	–
Forb					
4	**Perennial**			4–16	
	buckwheat	ERIOG	*Eriogonum*	2–7	–
	desert frasera	FRAL5	*Frasera albomarginata*	1–3	–
	King's flax	LIKI2	*Linum kingii*	1–3	–
	stoneseed	LITHO3	*Lithospermum*	1–3	–
	lupine	LUPIN	*Lupinus*	1–3	–
	phlox	PHLOX	*Phlox*	1–3	–
	milkvetch	ASTRA	*Astragalus*	1–3	–
	Indian paintbrush	CASTI2	*Castilleja*	1–3	–
	bird's-beak	CORDY	*Cordylanthus*	1–3	–
5	**Annual**			1–3	
Shrub/Vine					
6	**Primary Shrubs**			44–58	
	holywood	GUSA	*Guaiacum sanctum*	20–28	–
	black sagebrush	ARNO4	*Artemisia nova*	13–20	–
	Stansbury cliffrose	PUST	*Purshia stansburiana*	7–13	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	3–8	–
7	**Secondary Shrubs**			3–13	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	1–4	–
	desert ceanothus	CEGR	*Ceanothus greggii*	1–4	–
	Utah juniper	JUOS	*Juniperus osteosperma*	1–4	–
	Fremont's mahonia	MAFR3	*Mahonia fremontii*	1–4	–
	littleleaf horsebrush	TEGL	*Tetradymia glabrata*	1–4	–
	yucca	YUCCA	*Yucca*	1–4	–

Animal community

This site is poorly suited to livestock grazing, due to the low forage production and steep slopes. Broom snakeweed provides little browse for domestic livestock. It is of minimal value to cattle and horses but does provide fair quality winter browse for domestic sheep when green forage is scarce or lacking. Broom snakeweed can be toxic to domestic sheep, goats, and cattle particularly during winter or early spring when poor forage availability forces animals to consume large quantities. 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. Nevada ephedra is important winter range browse for domestic cattle, sheep and goats. 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. 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.

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:
Broom snakeweed is important to pronghorn in some areas, particularly during spring and summer. 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. Stansbury cliffrose is an important browse species for mule deer, pronghorn, game birds, and songbirds. Wild ungulates use it heavily in winter. Mule deer, bighorn sheep, and pronghorn browse Nevada ephedra, especially in spring and late summer when new growth is available. Galleta provides moderately palatable forage when actively growing and relatively unpalatable forage during dormant periods. Galleta provides poor cover for most wildlife species. 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.

Recreational uses

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

Other products

Some Native American peoples traditionally used broom snakeweed to construct brooms and as a treatment for indigestion. 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. Native Americans used Nevada ephedra as a tea to treat stomach and kidney ailments. Indian ricegrass was traditionally eaten by some Native Americans. The Paiutes used seed as a reserve food source.

Other information

Under natural conditions broom snakeweed quickly invades disturbed sites and can minimize soil erosion. It reportedly stabilizes loose wind-blown soils in mesquite sand dunes. 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. 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.

Type locality

Location 1: Lincoln County, NV	
Township/Range/Section	T3S R68E S31
UTM zone	N
UTM northing	4170126
UTM easting	0728365
General legal description	East of Panaca

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	05/20/2013
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills are common on steeper slopes and most frequently occur 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 rare to slight.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals are rare to slight and most frequently occur in areas subjected to summer convection storms

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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 50-60%; surface rock fragments less than 10%; shrub canopy <15%; foliar cover for perennial herbaceous plants <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 storms. Persistent litter (large woody material) will remain in place except during large rainfall events.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil stability values should be 1 to 4 on the coarse 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 single grain. 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 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:** Sparse shrub canopy and associated litter provide some protection from raindrop impact.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None

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 shrubs (snakeweed, black sagebrush)

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

    Other: 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 30% of total woody canopy; some of the mature bunchgrasses (to 25%) have dead centers.

14. **Average percent litter cover (%) and depth (in):** Between plant interspaces 20-30%; depth < ¼ 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 thru May) ± 125 lbs/ac; Favorable years ±200 lbs/ac and unfavorable years ± 75 lbs/ac

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** Potential invaders include cheatgrass, halogeton, Russian thistle, red-stem filaree, 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 reproduction or growth occurs during drought years.
