USDA Natural Resources
Conservation Service

Ecological site R029XY037NV
COBBLY SLOPE 5-8 P.Z.

Accessed: 05/12/2025

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.

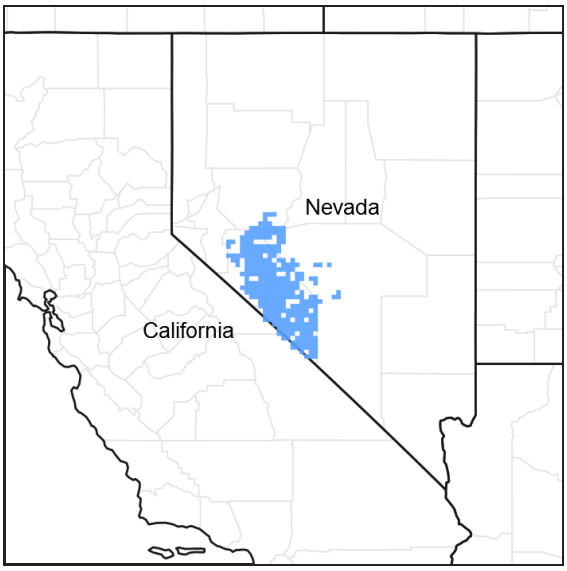

Figure 1. Mapped extent

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

R029XY016NV	**LOAMY UPLAND 5-8 P.Z.**
R029XY017NV	**LOAMY 5-8 P.Z.**
R029XY036NV	**COBBLY LOAM 5-8 P.Z.**

Similar sites

R029XY074NV	**SHALLOW LOAM 5-8 P.Z.** More productive site; MESP2-ATCO codominant shrubs
R029XY036NV	**COBBLY LOAM 5-8 P.Z.** More productive site; ACHY dominant grass
R029XY107NV	**GRANITIC COBBLY LOAM 5-8 P.Z.** ACSP12 dominant grass; soils from granitic PM
R029XY031NV	**SHALLOW DROUGHTY LOAM 5-8 P.Z.** More productive site; GRSP-MESP2 codominant shrubs
R029XY038NV	**COBBLY LOAM 8-12 P.Z.** ARTRW8 codominant shrub

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Menodora spinescens*
Herbaceous	(1) *Achnatherum speciosum* (2) *Pleuraphis jamesii*

Physiographic features

This site occurs on summits and sideslopes of low hills, mountain slopes, and fan remnants on all aspects. Slopes range from 2 to 75 percent, but slope gradients of 15 to 50 percent are most typical. Elevations are 4000 to about 7000 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Fan piedmont (3) Mountain slope
Elevation	1,219–2,134 m
Slope	2–75%
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 5 to 8 inches. Mean annual air temperature is 49 to 58 degrees F. The average growing season is about 100 to 180 days.

Table 3. Representative climatic features

Frost-free period (average)	180 days
Freeze-free period (average)	0 days
Precipitation total (average)	203 mm

Influencing water features

There is no influencing water features associated with this site.

Soil features

The soils associated with this site are predominantly very shallow to moderately deep and well drained. They are formed in residuum and colluvium from granite, siltstone and related sedimentary rocks. Runoff is medium to very high and permeability is slow to moderately rapid. Available water holding capacity is very low to low. 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. Soils having thin surface sand sheet will have lower stability values. The soil series associated with this site are: Berzatic, Blappert, Downeyville, Goldyke, Pintwater, Pumel, Rodad, Slatery, Terlco, and Theriot.

Table 4. Representative soil features

Surface texture	(1) Very gravelly sandy loam (2) Extremely cobbly fine sandy loam (3) Very stony fine sandy loam
Family particle size	(1) Loamy

Drainage class	Well drained
Permeability class	Slow to moderately rapid
Soil depth	5–91 cm
Surface fragment cover <=3"	28–70%
Surface fragment cover >3"	1–29%
Available water capacity (0-101.6cm)	0.76–4.57 cm
Calcium carbonate equivalent (0-101.6cm)	0–60%
Electrical conductivity (0-101.6cm)	0–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–45
Soil reaction (1:1 water) (0-101.6cm)	7.9–9.6
Subsurface fragment volume <=3" (Depth not specified)	15–55%
Subsurface fragment volume >3" (Depth not specified)	3–38%

Ecological dynamics

Where management results in abusive livestock use, Douglas' rabbitbrush, wolfberry, littleleaf horsebrush, Bailey's greasewood and galleta increase. Species likely to invade this site are annuals such as cheatgrass and mustards, burrobrush, snakeweed, halogeton and Russian thistle.

Fire Ecology:
The mean fire return interval for salt-desert shrub communities ranges 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. Spiny menodora often survives fire because its foliage does not readily burn. Greasewood may be killed by severe fires, but it commonly sprouts soon after low to moderate-severity fire. Fire typically destroys aboveground parts of Anderson and shockley's wolfberry, but the degree of damage to the plant depends on fire severity. 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. Increased presence of non-native annual grasses, such as cheatgrass, can alter fire regimes in shadscale communities by increasing fire frequency under wet to near-normal summer moisture conditions. When fire does occur, the effect on the ecosystem may be extreme. Budsage is killed by fire. Budsage communities rarely burn due to insufficient fire loads. Winterfat is either killed or top-killed by fire, depending on fire severity. Severe fire can kill the perennating buds located several inches above the ground surface and thus kills the plant. In addition, severe fire usually destroys seed on the plant. Low-severity fire scorches or only partially consumes the aboveground portions of winterfat and thus does not cause high mortality.

State and transition model

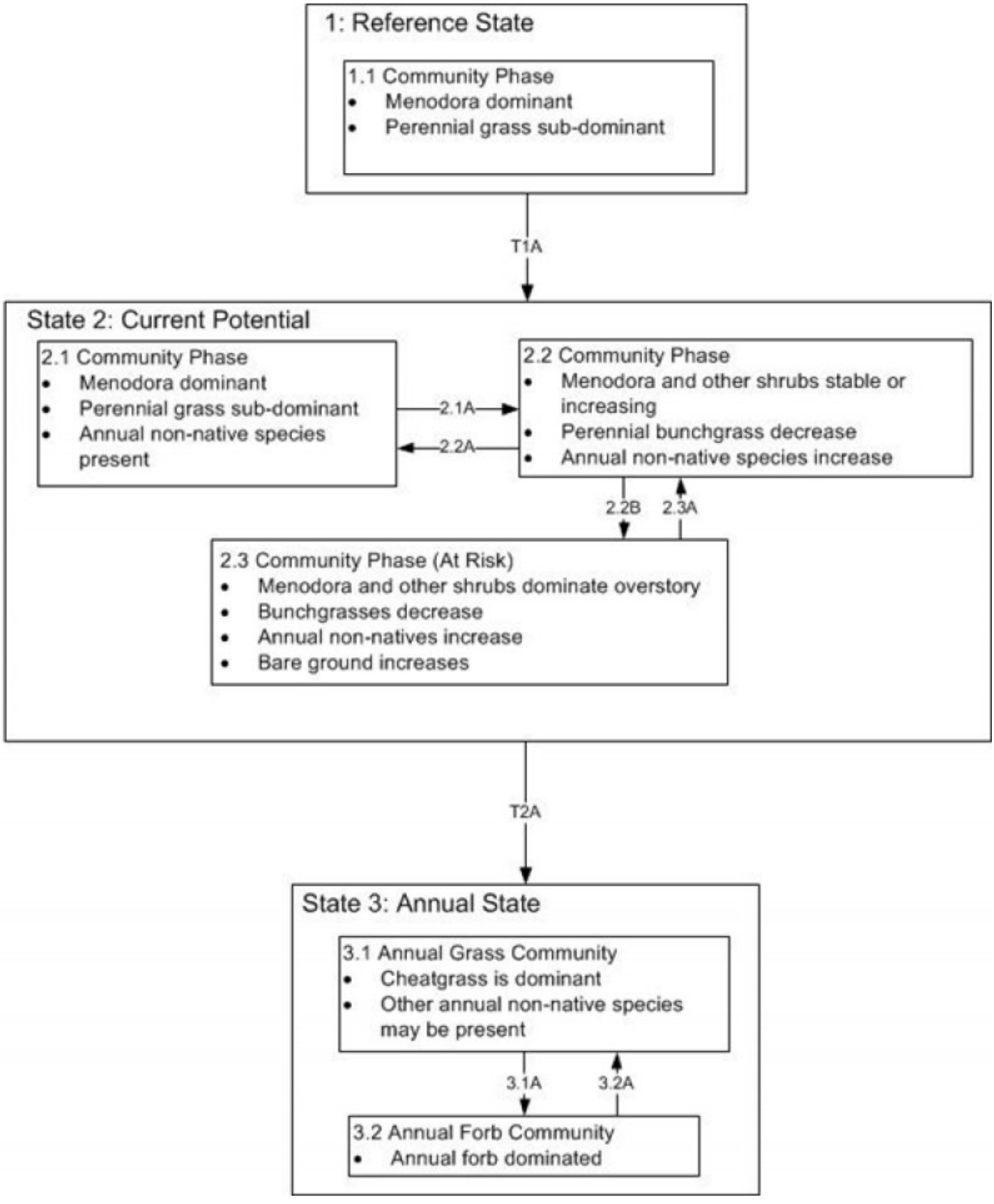

Figure 3. DRAFT STM

T1A: introduction of non-native species

2.1A: prolonged drought/ inadequate rest and recovery from defoliation
2.2A: rest and recovery
2.2B:prolonged drought/ inadequate rest and recovery from defoliation
2.3A: recovery or changes in management

T2A: Inadequate rest and recovery from defoliation and/or prolonged drought/Catastrophic wildfire.

3.1A: fire or cheatgrass die off
3.2A: time

Figure 4. DRAFT STM LEGEND

State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The reference plant community is dominated by spiny menodora. Nevada ephedra, Bailey's greasewood, wolfberry, galleta, desert needlegrass and needleandthread are other important species associated with this site. Potential vegetative composition is about 25% grasses, 5% forbs and 70% shrubs. Approximate ground cover (basal and crown) is 8 to 15 percent. Bare ground is 35 to 50%, surface rock fragments are over 50%, shrub canopy to 15%, and basal area for perennial herbaceous plants approximately 2%. Dead branches within individual shrubs are common and standing dead shrub canopy material may be as much as 35% of total woody canopy. Some of the mature bunchgrasses (approximately 25%) commonly have dead centers. Between plant interspaces litter is approximately 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	78	157	235
Grass/Grasslike	28	56	84
Forb	6	11	17
Total	**112**	**224**	**336**

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**			31–74	
	desert needlegrass	ACSP12	*Achnatherum speciosum*	11–22	–
	James' galleta	PLJA	*Pleuraphis jamesii*	11–22	–
	needle and thread	HECO26	*Hesperostipa comata*	4–18	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	4–11	–
2	**Secondary Perennial Grasses**			4–18	
	little Parish's needlegrass	ACPAD	*Achnatherum parishii var. depauperatum*	1–7	–
	squirreltail	ELEL5	*Elymus elymoides*	1–7	–
	Sandberg bluegrass	POSE	*Poa secunda*	1–7	–
Forb					
3	**Perennial**			4–18	
	beardtongue	PENST	*Penstemon*	1–4	–
	globemallow	SPHAE	*Sphaeralcea*	1–4	–
4	**Annual**			0–7	
Shrub/Vine					
5	**Primary Shrubs**			96–175	
	spiny menodora	MESP2	*Menodora spinescens*	56–78	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	4–18	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	4–11	–
	water jacket	LYAN	*Lycium andersonii*	6–11	–
	Shockley's desert-thorn	LYSH	*Lycium shockleyi*	6–11	–
	shadscale saltbush	ATCO	*Atriplex confertifolia*	4–11	–
	bud sagebrush	PIDE4	*Picrothamnus desertorum*	4–11	–
6	**Secondary Shrubs**			17–34	
	fourwing saltbush	ATCA2	*Atriplex canescens*	1–7	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	1–7	–
	spiny hopsage	GRSP	*Grayia spinosa*	1–7	–
	Nevada dalea	PSPO	*Psorothamnus polydenius*	1–7	–
	horsebrush	TETRA3	*Tetradymia*	1–7	–

Animal community

Livestock Interpretations:
This site is marginally suited for livestock grazing due to steep slopes and low forage production. Grazing management should be keyed to desert needlegrass, galleta, needleandthread, and indian ricegrass production. Desert needlegrass produces considerable basal foliage and is good forage while young. Young desert needlegrass is palatable to all classes of livestock. Mature herbage is moderately grazed by horses and cattle but rarely grazed by sheep. Galleta is a rhizomatous perennial which can resprout after top-kill by fire. 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. 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. Spiny menodora has lower palatability than the other shrubs but is consumed during early spring before spines mature. 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. Anderson and shockley's wolfberry are sometimes used as forage by livestock. Palatability of Anderson and shockley 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. Nevada ephedra is important winter range browse for domestic cattle, sheep and goats. 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. Budsage is palatable and nutritious forage for domestic sheep in the winter and spring although it is known to cause mouth sores in lambs. Budsage can be poisonous or fatal to calves when eaten in quantity. Budsage, while desired by cattle in spring, is poisonous to cattle when consumed alone. Winterfat is an important forage plant for livestock, especially during winter when forage is scarce. Abusive grazing practices have reduced or eliminated winterfat on some areas even though it is fairly resistant to browsing. Effects depend on severity and season of grazing.

Stocking rates vary over time depending upon season of use, climate variations, site, and previous and current management goals. A safe starting stocking rate is an estimated stocking rate that is fine tuned by the client by adaptive management through the year and from year to year.

Wildlife Interpretations:
Spiny menodora has lower palatability than the other shrubs but is consumed during early spring before spines mature. 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. Palatability of Anderson and shockley's wolfberry browse is presumably fair to low. Wolfberry species are 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. Mule deer, bighorn sheep, and pronghorn browse Nevada ephedra, especially in spring and late summer when new growth is available. 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. Budsage is palatable, nutritious forage for upland game birds, small game and big game in winter. Budsage is rated as "regularly, frequently, or moderately taken" by mule deer in Nevada in winter and is utilized by bighorn sheep in summer, but the importance of budsage in the diet of bighorns is not known. Bud sage comprises 18 – 35% of a Pronghorn’s diet during the spring where it is available. Chukar will utilize the leaves and seeds of bud sage. Budsage is highly susceptible to effects of browsing. It decreases under browsing due to year-long palatability of its buds and is particularly susceptible to browsing in the spring when it is physiologically most active. Winterfat is an important forage plant for Wildlife, especially during winter when forage is scarce. Winterfat seeds are eaten by rodents. Winterfat is a staple food for black-tailed jackrabbit. Mule deer and pronghorn antelope browse winterfat. Winterfat is used for cover by rodents. It is potential nesting cover for upland game birds, especially when grasses grow up through its crown. 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. Needleandthread is moderately important spring forage for mule deer, but use declines considerably as more preferred forages become 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.

Hydrological functions

Rills and water flow patterns are none to rare. Pedestals are rare with occurrence typically limited to area within water flow patterns. Frost heaving of shallow rooted plants should not be considered as normal condition. 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 are 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. Sparse shrub canopy and associated litter break raindrop impact. Medium to fine textured surface soils have moderate to slow infiltration and medium runoff.

Recreational uses

This site offers opportunities for photography and nature study. This site has potential for upland game bird hunting use and hiking.

Other products

The leaves, seeds and stems of greasewood are edible. 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. Seeds of shadscale were used by Native Americans of Arizona, Utah and Nevada for bread and mush. Indian ricegrass was traditionally eaten by some Native American peoples. The Paiutes used seed as a reserve food source.

Other information

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. Winterfat adapts well to most site conditions, and its extensive root system stabilizes soil. However, winterfat is intolerant of flooding, excess water, and acidic soils. Needleandthread grass is useful for stabilizing eroded or degraded sites.

Desert needlegrass seeds are easily germinated and have potential for commercial use. Desert needlegrass may be used for groundcover in areas of light disturbance, but it is susceptible to excessive trampling.

Type locality

Location 1: Esmeralda County, NV	
Township/Range/Section	T7S R41E S36
General legal description	Approximately 5 miles south of Gold Point, Slate Ridge area, Esmeralda County, Nevada. This site also occurs in Mineral and Nye 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

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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	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills none to rare.

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2. **Presence of water flow patterns:** Water flow patterns none to rare

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

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground 35 to 50%; surface rock fragments to over 50%; shrub canopy to 15%; basal area for perennial herbaceous plants <2%.

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5. **Number of gullies and erosion associated with gullies:** 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 are common. Gullies and head-cuts should be healing or stable.

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

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7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter (foliage from grasses and annual & perennial forbs) is expected to the 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 catastrophic 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 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. Soils having thin surface sand sheet will have lower stability values. (To be field tested.)

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is typically fine to medium platy or prismatic. Soil surface colors are light and soils are typified by an ochric epipedon. Organic carbon of the surface 2 to 3 inches is less than to 1 percent.

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 break raindrop impact. Medium to fine textured surface soils have moderate to slow infiltration and medium runoff.

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 not typical. Platy or massive sub-surface horizons, subsoil argillic horizons or hardpans shallow to the surface 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: Reference Plant Community: Low-statured shrub (spiny menodora). (By above ground production)

    Sub-dominant: Associated salt desert shrubs > deep-rooted, cool season, bunchgrasses = rhizomatous grass > shallow-rooted, perennial bunchgrasses = deep-rooted, perennial forbs = fibrous, shallow-rooted, perennial forbs = annual forbs. (By above ground production)

    Other:

    Additional:

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

14. **Average percent litter cover (%) and depth (in):** Between plant interspaces (<5%) and depth (±¼-inch).

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season (February thru April [May]) ± 200lbs/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:** Burrobrush, snakeweed, halogeton, Russian thistle, annual mustards, and cheatgrass are invaders on this site. Douglas' rabbitbrush and horsebrush are increasers on this site.

17. **Perennial plant reproductive capability:** All functional groups should reproduce in above average growing season years.