

Ecological site R029XY022NV LOAMY SLOPE 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.

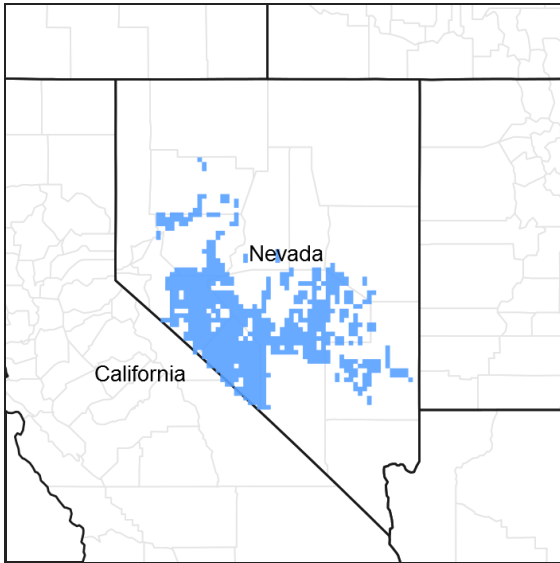


Figure 1. Mapped extent

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

R029XY017NV	LOAMY 5-8 P.Z.
R029XY021NV	LOAMY HILL 5-8 P.Z.
R029XY032NV	SODIC LOAM 3-5 P.Z.
R029XY033NV	LOAMY SLOPE 3-5 P.Z.
R029XY035NV	LOAMY 3-5 P.Z.

Similar sites

R029XY021NV	LOAMY HILL 5-8 P.Z. GRSP-LYAN codominant shrub
R029XY033NV	LOAMY SLOPE 3-5 P.Z. Less productive site
R029XY087NV	GRAVELLY LOAM 5-8 P.Z. SABA14 dominant shrub
R029XY017NV	LOAMY 5-8 P.Z. More productive site

R029XY035NV	LOAMY 3-5 P.Z. Lycium spp. codominant shrub
R029XY059NV	SHALLOW SILTY 5-8 P.Z. Less shrub density: essentially a homogeneous ATCO community

Table 1. Dominant plant species

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

Physiographic features

This site occurs on summits and sideslopes of low hills and mountains, fan remnants, fan piedmonts, and plateaus on all exposures. Slopes range from 0 to 75 percent, but slope gradients of 15 to 50 percent are most typical. Elevations are 4000 to about 7400 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Fan piedmont (3) Fan remnant
Elevation	1,219–2,256 m
Slope	0–75%
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 44 to 58 degrees F. The average growing season is about 90 to 200 days.

Table 3. Representative climatic features

Frost-free period (average)	200 days
Freeze-free period (average)	0 days
Precipitation total (average)	203 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils in this site are typically very shallow or very shallow and well drained. Surface layers typically have either a vesicular soil crust or high amounts of rock fragments. Desert pavement occurs on some soils. The available water capacity is very low to low varying with soil texture and depth. Surface soil reaction ranges from slight to strongly alkaline and pH increases with depth in the soil profile. In many of soils, moderate to heavy concentrations of salts and sodium accumulate in the lower subsoil. Runoff is low to very high. Soil series associated with this site are: Barnmot, Berzatic, Blappert, Downeyville, Ganafan, Garhill, Goldyke, Malpais, Pintwater, Pumel, Rodad, Roic, Spanel, Theriot, Tognoni, and Tokoper.

The representative soil series is Downeyville, a loamy-skeletal, mixed, superactive, mesic Lithic Haplargids. An

ochric epipedon occurs from the soil surface to 10 cm and an argillic horizon occurs from 10 to 23 cm.

Table 4. Representative soil features

Parent material	(1) Alluvium–tuff
Surface texture	(1) Very gravelly fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Very slow to moderately rapid
Soil depth	10–48 cm
Surface fragment cover ≤3"	19–70%
Surface fragment cover >3"	2–30%
Available water capacity (0-101.6cm)	1.02–7.87 cm
Calcium carbonate equivalent (0-101.6cm)	0–10%
Electrical conductivity (0-101.6cm)	0–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–12
Soil reaction (1:1 water) (0-101.6cm)	8–9.6
Subsurface fragment volume ≤3" (Depth not specified)	6–46%
Subsurface fragment volume >3" (Depth not specified)	2–33%

Ecological dynamics

Where management results in abusive grazing use by cattle and/or feral horses, shadscale, Douglas' rabbitbrush, horsebrush, and/or Bailey's greasewood increase while bud sagebrush, Indian ricegrass and needlegrasses decrease. Galleta occurs on this site more commonly in the central and eastern portion of MLRA 29. Species likely to invade this site are annuals such as mustards, halogeton, burrobrush, snakeweed, Russian thistle and cheatgrass.

Fire Ecology:

The mean fire return interval for shadscale-greasewood communities range from 35 to over 100 years. Shadscale 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. 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. 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

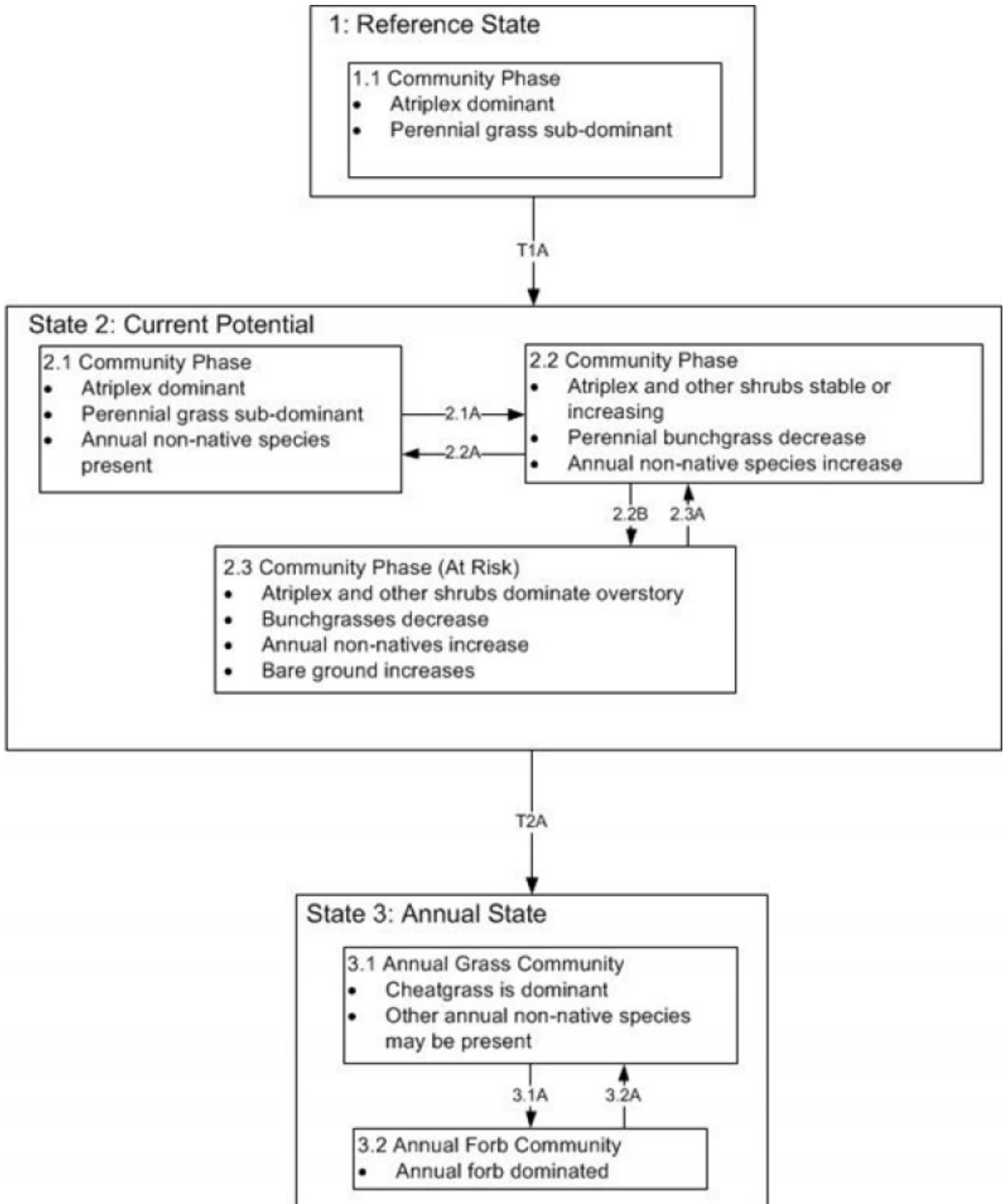


Figure 3. DRAFT STM

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 State

Community 1.1

Reference Plant Community

The reference plant community is dominated by shadscale, galleta, and Indian ricegrass. Other important species on this site are bud sagebrush and winterfat. Potential vegetative composition is about 30% grasses, 5% forbs, and 65% shrubs. Approximate ground cover (basal and crown) is 10 to 20 percent. Bare ground is 25 to 70%, surface rock fragments are variable 15 to over 60%, shrub canopy approximately 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	73	183	291
Grass/Grasslike	34	84	135
Forb	6	13	22
Total	113	280	448

State 2

Currently 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 (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Primary Perennial Grasses			15–108	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	0–43	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	15–43	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	0–22	–
2	Secondary Perennial Grasses			6–22	
	little Parish's needlegrass	ACPAD	<i>Achnatherum parishii</i> var. <i>depauperatum</i>	1–9	–
	King's eyelashgrass	BLKI	<i>Blepharidachne kingii</i>	1–9	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	1–9	–
Forb					
3	Perennial			6–22	
	King's eyelashgrass	BLKI	<i>Blepharidachne kingii</i>	1–9	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	1–6	–
4	Annual			0–15	
Shrub/Vine					
5	Primary Shrubs			124–253	
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	99–140	–
	bud sagebrush	PIDE4	<i>Picrothamnus desertorum</i>	15–43	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	6–28	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	6–15	–
6	Secondary Shrubs			15–43	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	1–9	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	1–9	–
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	1–9	–
	desert-thorn	LYCIU	<i>Lycium</i>	1–9	–
	spiny menodora	MESP2	<i>Menodora spinescens</i>	1–9	–
	littleleaf horsebrush	TEGL	<i>Tetradymia glabrata</i>	1–9	–

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 perennial grass and palatable shrub 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 provides a palatable and nutritious feed for livestock and wildlife during the spring and early summer. 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. 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. 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 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. 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. 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 none to rare on this site. A few can be expected on steeper slopes in areas subjected to summer convection storms or rapid spring snowmelt. Water flow patterns are often numerous in areas subjected to summer convection storms and are short and stable. 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. 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.

Recreational uses

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

Other products

Seeds of shadscale were used by Native Americans of Arizona, Utah and Nevada for bread and mush. The leaves,

seeds and stems of greasewood are edible. 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

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. Nevada ephedra is useful for erosion control, and seedlings have been successfully planted onto reclaimed strip mines, with survival ranging from 12 to 94%.

Type locality

Location 1: Esmeralda County, NV	
Township/Range/Section	T2N R40E S26
General legal description	Wepah Hills area, Esmeralda County, Nevada.
Location 2: Esmeralda County, NV	
Township/Range/Section	T2N R40E S35
General legal description	Wepah Hills area, Esmeralda County, Nevada.
Location 3: Nye County, NV	
Township/Range/Section	T2N R42E S3
General legal description	About 1 mile west of Tonopah, Siebert Mountain area, Nye County, Nevada. This site also occurs in Lincoln and mineral 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

HA/GD/VWM

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 are none to rare. A few can be expected on steeper slopes in areas subjected to

summer convection storms or rapid spring snowmelt.

2. **Presence of water flow patterns:** Water flow patterns are often numerous in areas subjected to summer convection storms. Flow patterns short and stable.

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.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground 25 to 70% 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) is 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 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. 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.)

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 the 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.

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. Platy or massive sub-surface horizons, subsoil argillic horizons 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: Salt-desert shrubs (shadscale, winterfat, bud sagebrush, etc.) >> deep-rooted, cool season, bunchgrasses. (By above ground production)

Sub-dominant: Rhizomatous grass = shallow-rooted, perennial bunchgrasses = associated, tall-statured, shrubs > 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 ($\pm 25\%$) have dead centers.
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14. **Average percent litter cover (%) and depth (in):** Between plant interspaces (10-20%) and depth ($\pm \frac{1}{4}$ -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 (February thru April [May]) ± 250 lbs/ac; Spring moisture significantly affects total production. Favorable years ± 400 lbs/ac and unfavorable years ± 100 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 halogeton, Russian thistle, annual mustards, and cheatgrass.
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17. **Perennial plant reproductive capability:** All functional groups should reproduce in average and above average growing season years. Little growth and reproduction occurs in drought years.
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