

Ecological site R029XY045NV **STONY CALCAREOUS SLOPE 8-12 P.Z.**

Accessed: 05/19/2024

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.

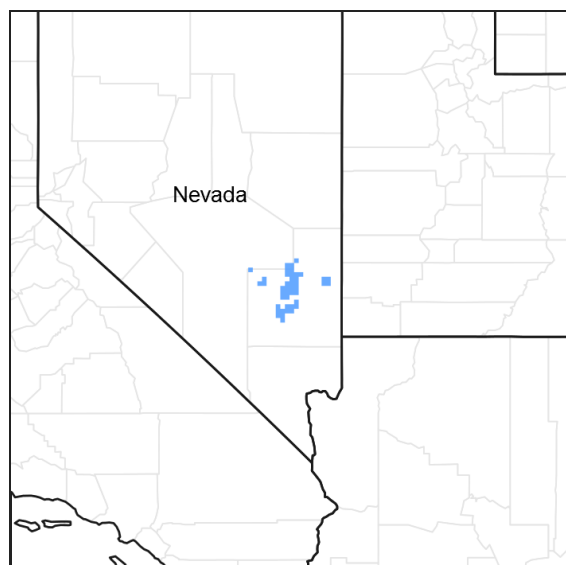


Figure 1. Mapped extent

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

F029XY069NV	PIMO-JUOS WSG 0R0504 12 to 16
R029XY064NV	STONY SLOPE 5-8 P.Z.
R029XY073NV	BOULDERY SLOPE 8-12 P.Z.

Similar sites

R029XY014NV	SHALLOW CALCAREOUS SLOPE 8-12 P.Z. ACSP12 minor grass
R029XY099NV	STONY CALCAREOUS HILL BEFR important shrub
R029XY028NV	SHALLOW CALCAREOUS SLOPE 12-14 P.Z. PSSPI dominant grass
R029XY081NV	SHALLOW CALCAREOUS HILL 10-14 P.Z. Less productive site
R029XY008NV	SHALLOW CALCAREOUS LOAM 8-12 P.Z. ACSP12 minor grass

R029XY015NV	SHALLOW CALCAREOUS HILL 8-10 P.Z. JUOS dominates visual aspect
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia nova</i>
Herbaceous	(1) <i>Achnatherum speciosum</i>

Physiographic features

This site occurs on sideslopes and summits of low mountains and hills on all exposures. Slopes range from 8 to 75 percent, but slope gradients of 15 to 50 percent are typical. Elevations are 4700 to about 5500 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	1,433–1,676 m
Slope	8–75%
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 12 inches. Mean annual air temperature is 50 to 56 degrees F. The average growing season is about 120 to 150 days

Table 3. Representative climatic features

Frost-free period (average)	150 days
Freeze-free period (average)	0 days
Precipitation total (average)	305 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are shallow. They have formed predominantly from volcanic rock sources and have a shallow effective rooting zone with depth to a hardpan or bedrock ranging from 10 to 20 inches. The soils have high amounts of gravels throughout the soil profile. The soil surface typically has a cover of 75 percent or more rock fragments. The available water capacity is very low. Runoff is moderate to rapid. Soil series associated with this site include: Amtoft, Chubard, Lomoine and Stewval.

Table 4. Representative soil features

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

Drainage class	Well drained
Permeability class	Rapid
Soil depth	25–51 cm
Surface fragment cover <=3"	30–35%
Surface fragment cover >3"	15–37%
Available water capacity (0-101.6cm)	0.76–2.54 cm
Calcium carbonate equivalent (0-101.6cm)	0–70%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–2
Soil reaction (1:1 water) (0-101.6cm)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	30–46%
Subsurface fragment volume >3" (Depth not specified)	12–35%

Ecological dynamics

Where management results in abusive livestock use, Douglas rabbitbrush, shadscale, threadleaf snakeweed and galleta increase, while Indian ricegrass, desert needlegrass, and palatable forbs and shrubs decrease. Cheatgrass and annual forbs are likely to invade this site. Shadscale is recognized as a seral community dominant after fire or other disturbance to the black sagebrush community at the lower elevation and precipitation range of this site. Utah juniper and/or singleleaf pinyon readily increase on this site where it occurs adjacent to these woodlands.

Fire Effects:

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. 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. Green ephedra generally sprouts vigorously from the roots or woody root crown after fire and rapidly produces aboveground biomass from surviving meristematic tissue. 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. 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.

State and transition model

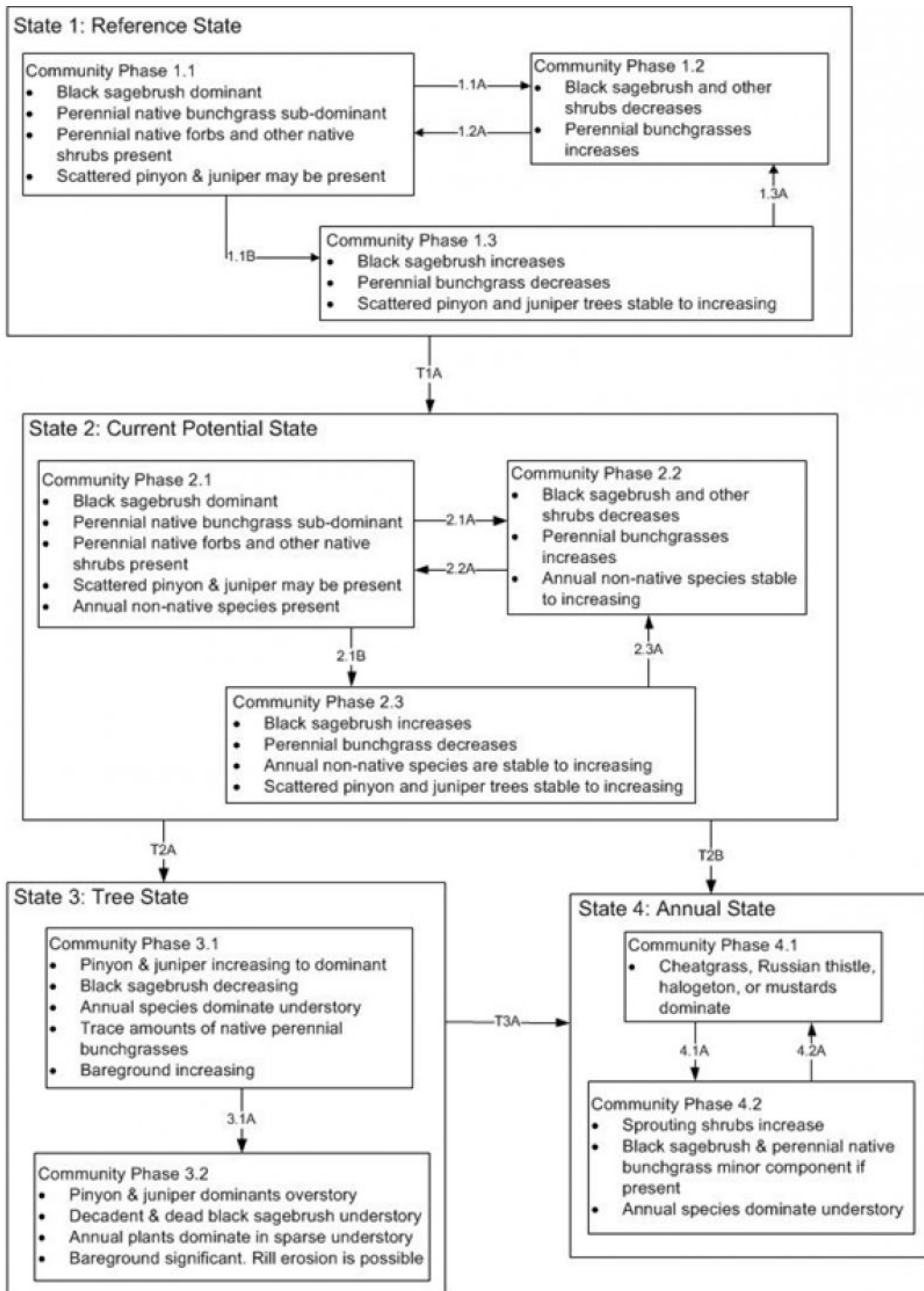


Figure 3. DRAFT STM

State 1: Representative of the reference conditions prior to Euro-American settlement in the west.

1.1A: fire or other disturbance that removes sagebrush canopy

1.1B: absence of disturbance and natural regeneration over time

1.2A: absence of disturbance and natural regeneration over time

1.3A: fire or other disturbance that removes sagebrush canopy

T1A: introduction of non-native species

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.

2.1A: fire or other disturbance that removes sagebrush canopy

2.1B: absence of disturbance and natural regeneration over time, may be coupled with inadequate rest and recovery from defoliation

2.2A: absence of disturbance and natural regeneration over time

2.3A: fire or other disturbance that removes sagebrush canopy

T2A: long term absence of fire and natural regeneration of pinyon & juniper trees

T2B: reoccurring severe fire

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.

3.1A: absence of disturbance and natural regeneration over time

T3A: reoccurring severe fire

State 4: Dominated by non-native annuals. Changes in disturbance return intervals and nutrient dynamics creating a positive feedback loop.

4.1A: absence of disturbance and natural regeneration over time

4.2A: fire or other disturbance that removed shrub canopy

Figure 4. DRAFT STM LEGEND

State 1

Reference State

Community 1.1

Reference Plant Community

The reference plant community is dominated by black sagebrush and desert needlegrass. Potential vegetative composition is about 45% grasses, 5% forbs, and 50% shrubs and trees. Approximate ground cover (basal and crown) is 10 to 20 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	108	241	373
Grass/Grasslike	101	228	353
Forb	11	25	39
Tree	4	11	19
Total	224	505	784

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 (%)
Grass/Grasslike					
1	Primary Perennial Grasses			177–304	
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	127–177	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	50–101	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	0–26	–
2	Secondary Perennial Grasses			10–76	
	little Parish's needlegrass	ACPAD	<i>Achnatherum parishii</i> var. <i>depauperatum</i>	2–16	–
	Scribner needlegrass	ACSC11	<i>Achnatherum scribneri</i>	2–16	–
	threeawn	ARIST	<i>Aristida</i>	2–16	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	2–16	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	2–16	–
	muttongrass	POFE	<i>Poa fendleriana</i>	2–16	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	2–16	–
Forb					
3	Perennial			10–40	
	globemallow	SPHAE	<i>Sphaeralcea</i>	2–16	–
	threeawn	ARIST	<i>Aristida</i>	2–8	–
4	Annual			0–16	
Shrub/Vine					
5	Primary Shrubs			163–305	
	black sagebrush	ARNO4	<i>Artemisia nova</i>	127–177	–
	Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>	26–76	–
	banana yucca	YUBA	<i>Yucca baccata</i>	0–26	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	4–13	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	6–12	–
6	Secondary Shrubs			26–76	
	Bigelow sage	ARBI3	<i>Artemisia bigelovii</i>	2–26	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	2–26	–
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	2–26	–
	Apache plume	FAPA	<i>Fallugia paradoxa</i>	2–26	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	2–26	–
	wild crab apple	PERA4	<i>Peraphyllum ramosissimum</i>	2–26	–
Tree					
7	Evergreen			4–31	
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	2–16	–
	singleleaf pinyon	PIMO	<i>Pinus monophylla</i>	2–16	–
	Apache plume	FAPA	<i>Fallugia paradoxa</i>	2–8	–
	wild crab apple	PERA4	<i>Peraphyllum ramosissimum</i>	2–8	–
	bud sagebrush	PIDE4	<i>Picrothamnus desertorum</i>	2–8	–

Animal community

Livestock Interpretations:

This site is suited for livestock grazing. Grazing management should be keyed to desert needlegrass, indian ricegrass, and perennial grass 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. 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. 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. 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. Green ephedra is heavily browsed by livestock on winter range but only moderately or lightly browsed during other seasons. 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:

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. Green ephedra is an important browse species for big game animals. Green ephedra is heavily used by wildlife on winter ranges. Mule deer, bighorn sheep, and pronghorn browse Nevada ephedra, especially in spring and late summer when new growth is available. Desert needlegrass and Indian ricegrass are important forage species for several wildlife species.

Hydrological functions

Runoff is medium. Permeability is 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 hiking and has potential for upland and big game hunting.

Other products

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

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.

Desert needlegrass seeds are easily germinated and have potential for commercial use. Green ephedra is listed as a successful shrub for restoring western rangeland communities and can be used to rehabilitate disturbed lands. It also has value for reducing soil erosion on both clay and sandy soils. 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. Green ephedra establishes readily through direct seeding, transplants, and stem cuttings. Desert needlegrass may be used for groundcover in areas of light disturbance, but it is susceptible to excessive trampling.

Type locality

Location 1: Lincoln County, NV	
Township/Range/Section	T3 R62 S35
Latitude	37° 38' 35"
Longitude	115° 0' 0"
General legal description	NW¼ Section 35, T3S. R62E. MDBM. About 10 miles south of Panaca, Cedar Range, Lincoln County, Nevada.

Other references

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

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)	
Contact for lead author	State Rangeland Management Specialist.
Date	11/01/1988
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. Number and extent of rills:

2. Presence of water flow patterns:

3. Number and height of erosional pedestals or terracettes:

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not

bare ground):

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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

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:

Sub-dominant:

Other:

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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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:
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17. **Perennial plant reproductive capability:**
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