

Ecological site R023XY013NV

DRY MEADOW

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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.

Ecological site concept

Currently there is only a draft of the initial concept for this ecological site. The initial concept for this site places it within the Seasonally Flooded Basin Wildrye Ecological Site Group. To view the General STM and other information available for this ESG please go to <https://edit.jornada.nmsu.edu/catalogs/esg/023X/R023XY916NV>

This site also occurs on floodplains and drainage ways but is also often associated with low-flow seeps and springs. It is dominated by Nevada bluegrass and forbs like yarrow (*Achillea* spp.), iris (*Iris missouriensis*), cinquefoil (*Potentilla*), and other mesic forbs. This site has a seasonally high water table within 20 inches of the soil surface in the spring. Soils are deep and very dark in color. This site is slightly less productive than the modal site with 1700 lb/ac in normal years. Baltic rush may increase with inappropriate grazing management. This site has a similar STM with 3 stable states.

Associated sites

F023XY029NV	POTR5/PONE3-CAREX-ELTR7
F023XY034NV	POBAT/SALIX/LEYMU
R023XY009NV	LOAMY BOTTOM 8-12 P.Z.
R023XY025NV	WET MEADOW 14+ P.Z.

Similar sites

R023XY025NV	WET MEADOW 14+ P.Z. has full growing season water; DECE dominant grass; more productive site
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Poa nevadensis</i>

Physiographic features

This site occurs on floodplains, drainageways, and lake plains and is usually associated with low-flow seeps and springs. Slopes range from 0 to over 8 percent, but slope gradients of 0 to 2 percent are typical. Elevations are 4400 to 9000 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Drainageway (3) Lake plain
Flooding duration	Very brief (4 to 48 hours) to long (7 to 30 days)
Flooding frequency	Rare to frequent
Elevation	4,400–9,000 ft
Slope	0–8%
Water table depth	6–84 in
Aspect	Aspect is not a significant factor

Climatic features

The climate associated with this site is semiarid and characterized by cold, moist winters and warm, dry summers. Average annual precipitation is 10 to over 14 inches. Mean annual air temperature is 40 to 45 degrees F. The average growing season is about 80 to 100 days.

Nevada's climate is predominantly arid, with large daily ranges of temperature, infrequent severe storms, heavy snowfall in the higher mountains, and great location variations with elevation. Three basic geographical factors largely influence Nevada's climate: continentality, latitude, and elevation. Continentality is the most important factor. The strong continental effect is expressed in the form of both dryness and large temperature variations. Nevada lies on the eastern, lee side of the Sierra Nevada Range, a massive mountain barrier that markedly influences the climate of the State. The prevailing winds are from the west, and as the warm moist air from the Pacific Ocean ascend the western slopes of the Sierra Range, the air cools, condensation occurs and most of the moisture falls as precipitation. As the air descends the eastern slope, it is warmed by compression, and very little precipitation occurs. The effects of this mountain barrier are felt not only in

the West but throughout the state, with the result that the lowlands of Nevada are largely desert or steppes. The temperature regime is also affected by the blocking of the inland-moving maritime air. Nevada sheltered from maritime winds, has a continental climate with well-developed seasons and the terrain responds quickly to changes in solar heating. Nevada lies within the mid-latitude belt of prevailing westerly winds which occur most of the year. These winds bring frequent changes in weather during the late fall, winter and spring months, when most of the precipitation occurs. To the south of the mid-latitude westerlies, lies a zone of high pressure in subtropical latitudes, with a center over the Pacific Ocean. In the summer, this high-pressure belt shifts northward over the latitudes of Nevada, blocking storms from the ocean. The resulting weather is mostly clear and dry during the summer and early fall, with scattered thundershowers. The eastern portion of the state receives significant summer thunderstorms generated from monsoonal moisture pushed up from the Gulf of California, known as the North American monsoon. The monsoon system peaks in August and by October the monsoon high over the Western U.S. begins to weaken and the precipitation retreats southward towards the tropics (NOAA 2004).

Average annual precipitation is 16 to over 20 inches. Mean annual air temperature is 41 to 44 degrees F. The average growing season is about 50 to 70 days.

Mean annual precipitation at the Bear Creek, Nevada SNOTEL station (170501020301) is 37.69 inches.

monthly mean precipitation is:

January 3.84; February 3.75; March 4.38; April 4.9;
 May 3.99; June 2.82; July .95; August 1.66;
 September 1.22; October 2.12;
 November 3.67; December 4.38.

Table 3. Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	
Precipitation total (average)	12 in

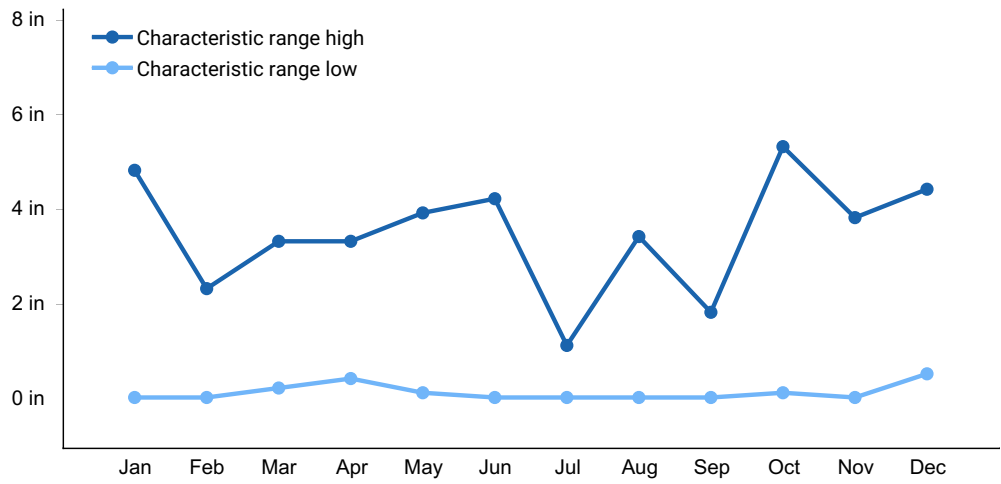


Figure 1. Monthly precipitation range

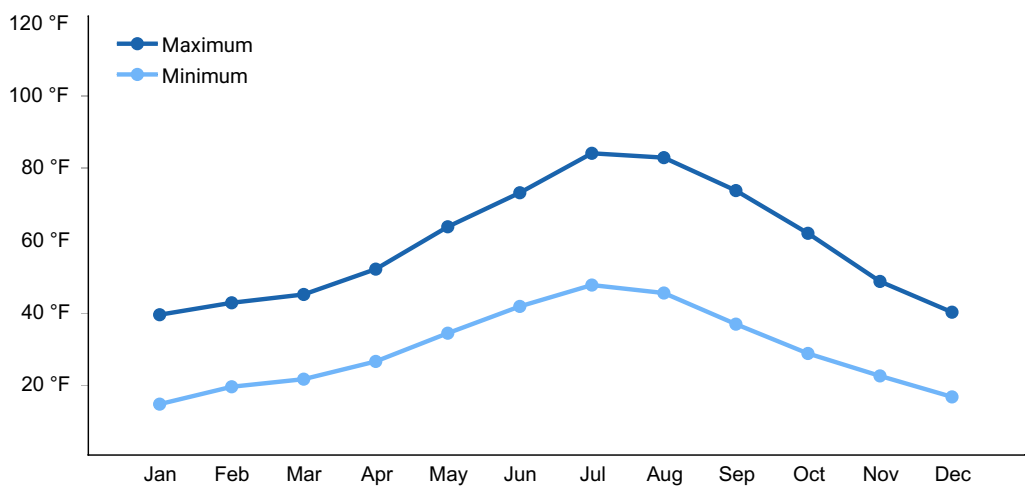


Figure 2. Monthly average minimum and maximum temperature

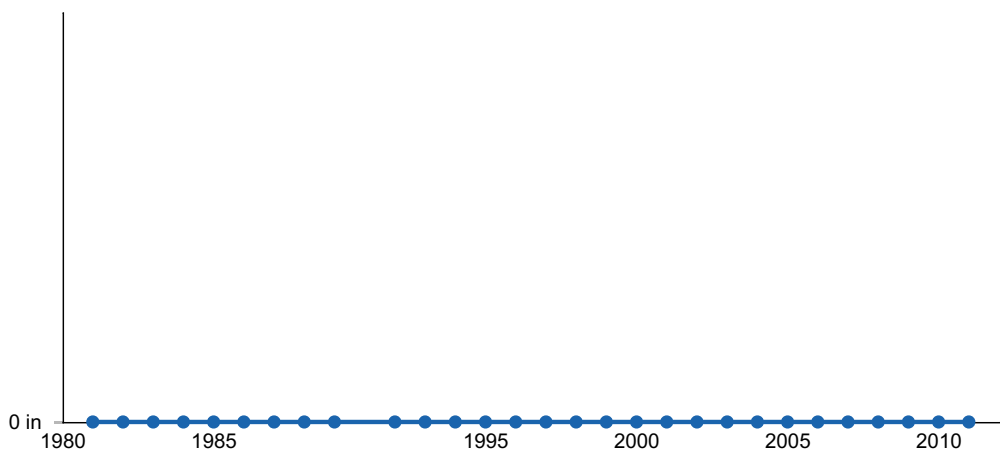


Figure 3. Annual precipitation pattern

Influencing water features

There is a seasonally high water table within 20 inches of the surface in the spring.

Soil features

The soils associated with this site are very deep, moderately well drained, and have formed in alluvium derived from pyroclastic and extrusive volcanic rocks. Permeability is slow and available water capacity is moderate to high. Clay content in the particle control sections is 40 to 60 percent. A mollic epipedon occurs from the surface to 28 inches. Vertical cracks occur on the surface to 22 inches. Typical soil series associated with this site is Grimlake, fine, smectitic, frigid Aquic Haploxererts.

Table 4. Representative soil features

Parent material	(1) Alluvium–pyroclastic rock
Surface texture	(1) Cobbly clay (2) Sandy loam
Family particle size	(1) Clayey
Drainage class	Moderately well drained
Permeability class	Slow
Soil depth	72–84 in
Surface fragment cover ≤3"	0–10%
Surface fragment cover >3"	0–10%
Available water capacity (0-40in)	5.9–8.3 in
Calcium carbonate equivalent (0-40in)	0–5%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	6.1–8.4
Subsurface fragment volume ≤3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Where management results in abusive grazing use by livestock and/or feral horses, meadow barley, rabbitsfootgrass, sedges and Baltic rush will increase in abundance, while Nevada bluegrass and palatable forbs will decrease. Misuse of this site can cause gully

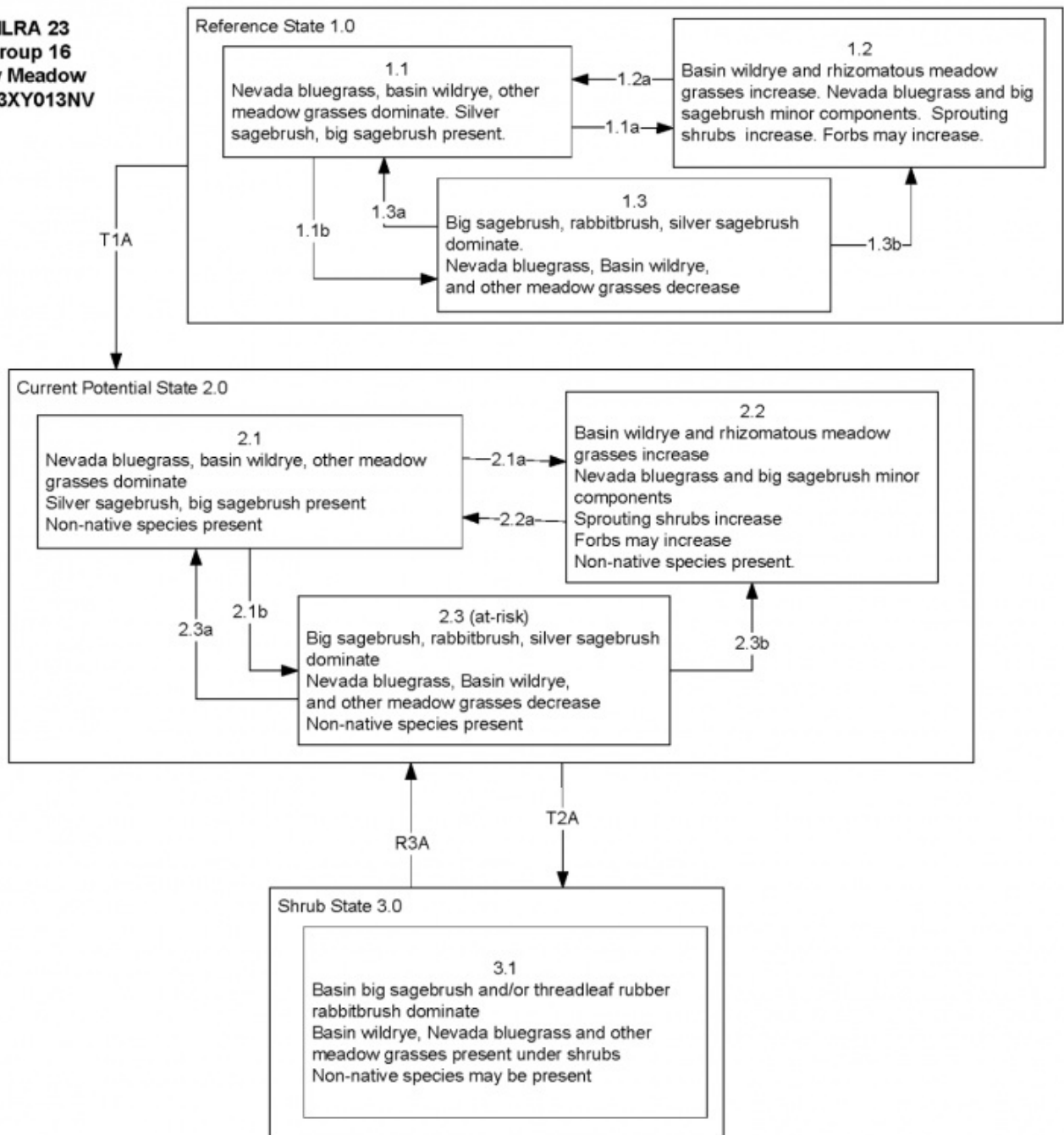
erosion resulting in a lowering of the water table and development of a site dominated by shrub species.

Fire Ecology:

Fire in dry meadow communities often involves stand replacing fires. The fire return interval occurs every 0 to 35 years. Nevada bluegrass is generally unharmed by fire. It produces little litter, and its small bunch size and sparse litter reduces the amount of heat transferred to perennating buds in the soil. Sedge is top-killed by fire, with rhizomes protected by insulating soil. The rhizomes of sedge species may be killed by high-severity fires that remove most of the soil organic layer. Reestablishment after fire occurs by seed establishment and/or rhizomatous spread.

State and transition model

**MLRA 23
Group 16
Dry Meadow
R023XY013NV**



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KEY**

Reference State 1.0 Community Phase Pathways

- 1.1a: High severity fire significantly reduces big sagebrush cover and leads to early/mid-seral community dominated by grasses, forbs and sprouting shrubs.
- 1.1b: Time and lack of disturbance such as fire or drought. Excessive herbivory may also decrease perennial understory and favor shrub overstory.
- 1.2a: Time and lack of disturbance allows for big sagebrush regeneration.
- 1.3a: A low severity fire, Aroga moth, or combinations will reduce some of the big sagebrush overstory and allow grass species to increase.
- 1.3b: High severity fire significantly reduces big sagebrush cover and allows grass species to dominate.

Transition T1A: Introduction of non-native species.

Current Potential State 2.0 Community Phase Pathways

- 2.1a: High severity fire significantly reduces big sagebrush cover and leads to early/mid-seral community dominated by grasses, forbs and sprouting shrubs. Non-native species present.
- 2.1b: Time and lack of disturbance such as fire or drought. Inappropriate grazing management may also reduce perennial understory and favor shrub overstory.
- 2.2a: Time and lack of disturbance allows for regeneration of big sagebrush.
- 2.3a: A low severity fire, Aroga moth, or combinations will reduce some of the big sagebrush overstory and allow grass species to increase. May also be caused by brush management with minimal soil disturbance or late-fall/winter grazing that causes mechanical damage to sagebrush.
- 2.3b: High severity fire significantly reduces big sagebrush cover and allows grass species to dominate.

Transition T2A: Time and lack of disturbance, may be coupled with grazing management and/or hydrologic changes that favor shrubs over perennial grasses.

Shrub State 3.0 Community Phase Pathways

None.

Restoration Pathway R3A: Mechanical/chemical brush treatment coupled with herbicide. Gully plugs or other hydrologic modifiers may be necessary to restore hydrologic function.

State 1 Reference Plant Community

Community 1.1 Reference Plant Community

The reference plant community is dominated by Nevada bluegrass. Potential vegetative composition is about 75% grasses, 20% forbs, and 5% shrubs. Approximate ground cover (basal and crown) is about 50 to 65 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	975	1275	1650
Forb	260	340	440
Shrub/Vine	65	85	110
Total	1300	1700	2200

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Primary Perennial Grasses/Grasslikes			765–1105	
	sedge	CAREX	<i>Carex</i>	85–255	–
2	Secondary Perennial Grasses			340–595	
	slender wheatgrass	ELTRT	<i>Elymus trachycaulus ssp. trachycaulus</i>	9–85	–
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	9–85	–
	meadow barley	HOBR2	<i>Hordeum brachyantherum</i>	9–85	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	9–85	–
	beardless wildrye	LETR5	<i>Leymus triticoides</i>	9–85	–
	mat muhly	MURI	<i>Muhlenbergia richardsonis</i>	9–85	–
	alpine timothy	PHAL2	<i>Phleum alpinum</i>	9–85	–
	annual rabbitsfoot grass	POMO5	<i>Polypogon monspeliensis</i>	9–85	–
	Kentucky bluegrass	POPR	<i>Poa pratensis</i>	9–85	–
Forb					
3	Perennial			255–425	
	varrow	ACHIL	<i>Achillea</i>	9–51	–

	Rocky Mountain iris	IRMI	<i>Iris missouriensis</i>	9–51	–
	cinquefoil	POTEN	<i>Potentilla</i>	9–51	–
	buttercup	RANUN	<i>Ranunculus</i>	9–51	–
	dandelion	TARAX	<i>Taraxacum</i>	9–51	–
	clover	TRIFO	<i>Trifolium</i>	9–51	–
Shrub/Vine					
4	Primary Shrubs			34–136	
	silver sagebrush	ARCA13	<i>Artemisia cana</i>	9–17	–
	big sagebrush	ARTR2	<i>Artemisia tridentata</i>	9–17	–
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	9–17	–
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	9–17	–
	rose	ROSA5	<i>Rosa</i>	9–17	–
	willow	SALIX	<i>Salix</i>	9–17	–

Animal community

Livestock Interpretations:

This site is suitable for livestock grazing. Grazing management should be keyed to perennial grass production. Nevada bluegrass is a widespread forage grass. It is one of the earliest grasses in the spring and is sought by domestic livestock and several wildlife species. Nevada bluegrass is a palatable species, but its production is closely tied to weather conditions. It produces little forage in drought years, making it a less dependable food source than other perennial bunchgrasses. Sedge provides good to fair forage for domestic 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:

Nevada bluegrass is desirable for pronghorn antelope and mule deer in the spring and preferable in the spring, summer, and fall for elk and desirable as part of their winter range. Sedges have a high to moderate resource value for elk and a medium value for mule deer. Elk consume beaked sedge later in the growing season.

Hydrological functions

Runoff is medium to very high. Permeability is slow to moderately slow. Rills are none. Water flow patterns are none. Pedestals are none. Gullies are none. Deep-rooted perennial grasses and/or rhizomatous grasses slow runoff and increase infiltration. Shrub canopy and associated litter break raindrop impact and provide opportunity for snow catch and moisture accumulation on site.

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.

Type locality

Location 1: Washoe County, NV	
Township/Range/Section	T16N R19E S3
UTM zone	N
UTM northing	264502
UTM easting	4646720
Latitude	41° 56' 14"
Longitude	119° 50' 26"
General legal description	SE 1/4 NW 1/4, Bally Mountain area, Washoe County, Nevada. This site also occurs in Humboldt County, Nevada.
Location 2: Washoe County, NV	
Township/Range/Section	T39N R19E S5
UTM zone	N
UTM northing	259349
UTM easting	4575309
Latitude	41° 17' 36"
Longitude	119° 52' 26"
General legal description	Stringer meadows northeast of Hays Canyon Peak, Washoe County, Nevada. This site also occurs in Humboldt 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>).

Great Basin Ecological Site Development Project: State and Transition Models for Major Land Resource Area 23, Nevada and portions of California (Online; <https://naes.agnt.unr.edu/PMS/Pubs/2019-4060.pdf>)

Contributors

BH/SW

T Stringham (UNR under contract with BLM)

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)	Patti Novak-Echenique
Contact for lead author	State Rangeland Management Specialist
Date	05/14/2010
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None

2. **Presence of water flow patterns:** A few waterflow patterns will occur after recent flooding events.

3. **Number and height of erosional pedestals or terracettes:** None

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen,**

moss, plant canopy are not bare ground): Bare Ground \pm 10-20%.

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 of grasses and annual & perennial forbs) only expected to move during periods of flooding by adjacent streams. Persistent litter (large woody material) will remain in place except during major flooding 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 will range from 3 to 6. (To be field tested.)

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Structure of soil surface is medium prismatic. Soil surface colors are dark grays and soils are typified by a mollic epipedon. Organic matter in the surface horizon will range from 1 to 3 percent.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Deep-rooted perennial grasses and/or rhizomatous grasses slow runoff and increase infiltration. Shrub canopy and associated litter break raindrop impact and provide opportunity for snow catch and moisture accumulation on site.

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. Subangular blocky or prismatic layers are normal for this site and are not to be interpreted as compaction

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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: Tall-statured, deep-rooted, cool season, perennial bunchgrasses > short-statured rhizomatous grasses > associated perennial grasses and grass-like plants

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

Other:

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Some mortality will occur in the centers of perennial bunchgrasses.
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14. **Average percent litter cover (%) and depth (in):** Under canopy and within plant interspaces up to 70% and depth of litter \pm 1/2 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 (through end of May) \pm 1700 lbs/ac; Favorable years \pm 2200 lbs/ac, Unfavorable years \pm 1300 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 annual mustards, annual kochia, pigweed, and perennial pepperweed.
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17. **Perennial plant reproductive capability:** All functional groups should reproduce in average (or normal) and above average growing season years.
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