Ecological site R062XY005SD
Wet Subirrigated

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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.

MLRA notes

Major Land Resource Area (MLRA): 062X–Black Hills

The Black Hills (MLRA 62) is a unique, low lying mountain range situated in the midst of a mixed short and mid-grass prairie. It is a true “Island in the Plains,” as it has geophysical and biological attributes that are unlike the surrounding area. The Black Hills have strong floristic ties to four of the North American biomes: Cordilleran (Rocky Mountain) Forest, Northern Coniferous Forest, Eastern Deciduous Forest, and Grasslands. MLRA 62 is approximately 3,040 square miles in size; 74 percent is located in South Dakota, and 26 percent is in Wyoming. The towns of Lead, Deadwood, Hill City, and Custer, South Dakota, are in this area. U.S. Highways 16 and 385 cross the MLRA. The Black Hills National Forest, Custer State Park, Mt. Rushmore National Monument, Wind Cave National Park, and Jewel Cave National Monument are located in this MLRA. This area forms the core of the Black Hills and the Bear Lodge Mountains where the elevation generally ranges between 3,600 to 6,565 feet, however, Black Elk Peak (formerly Harney Peak) rises to 7,242 feet. The slopes vary from moderately sloping on some of the high plateaus to very steeply sloping along drainageways and on peaks and ridges. Narrow valleys generally are gently sloping to strongly sloping. The Black Hills uplift is the product of the Laramide mountain-building episodes that produced most of the ranges in the Rocky Mountains. Uplift began near the end of the Cretaceous period, 65 million years ago and ended by 35 million years ago (Froiland, 1990). The core of the Black Hills is a plutonic mass of granite with steeply dipping metamorphic rocks, primarily slate and schist, that directly surrounds the granite core. A plateau of Mississippian limestone surrounds the igneous and metamorphic rock core. The Madison limestone is broken around the outer edges of the uplifted area. The Permian Minnekahta limestone forms the outermost boundary of the area. Many other tilted sandstone, shale, and limestone units are exposed like a bathtub ring inside the steeply dipping Madison limestone. The dominant soil orders in this MLRA are Alfisols (forest soils) and Mollisols (grassland soils). The soils in the area have a frigid or cryic soil temperature regime, a udic or ustic soil moisture regime, and mixed, micaceous, or smectitic mineralogy. They are shallow to very deep, generally are well drained, and are loamy in texture. The Black Hills MLRA supports open to dense forest vegetation. Ponderosa pine is the dominant species across the Black Hills. White spruce grows at the higher elevations and along the major drainageways. Bur oak is found intermixed with pine in the northern and eastern fringes of the Black Hills, and Rocky Mountain juniper is most common in the southern portion of the Black Hills. Aspen and paper birch are minor components found throughout the Black Hills. Prairie dropseed, roughleaf ricegrass, green needlegrass, poverty oatgrass, Richardson’s needlegrass, slender wheatgrass, and Canada wildrye are the most common native grasses under open forest stands. The most common native shrubs are bearberry, common juniper, grouse whortleberry, poison ivy, and Saskatoon serviceberry. MLRA 62 land ownership is approximately 47 percent private and 53 percent federal. Rangeland and forestland are split almost equally between private and federal ownership (47 percent each). Minor areas of land are privately owned cropland and urban development. The forestland in this area is used mainly for timber production, recreation, and grazing. The major resource concerns are soil erosion and surface compaction caused by logging, mining, wildfires, grazing, and urban expansion. The quality of both ground and surface water is another concern, especially in the northern part of the Black Hills. The primary cause for concern is contamination from mine waste and septic systems in areas of rural development and urban expansion (USDA-NRCS, 2006: Ag Handbook 296).

LRU notes

For development of ecological sites, MLRA 62 is divided into three Land Resource Units (LRUs) or physiographic zones (A, B, C, and Y). Each LRU has a set of ecological sites that represents these zones. The LRU is identified in the Ecological Site ID: R062XY000SD; “062X” identifies the MLRA, and the next letter “Y” identifies the LRU. Note: The organization of Ecological Site IDs will likely change in the future. The North, LRU-A includes the northern Black Hills and Bear Lodge Mountains. It receives between 22 and 30 inches of annual precipitation and has a frigid soil temperature regime. The High Central, LRU-B includes the high elevation (> 6,200 feet) central core of the Black Hills, which receives between 25 to 35 inches of annual precipitation and has a cryic soil temperature regime. The South, LRU-C includes the southern portion of the Black Hills and receives between 17 to 21 inches of annual precipitation and has a frigid soil temperature regime. One additional grouping of ecological sites that are common to the entire MLRA are designated with a “Y” in the ecological site ID.

Classification relationships

USDA Land Resource Region G—Western Great Plains Range and Irrigated Region: Major Land Resource Area (MLRA) 62—Black Hills US Environmental Protection Agency (EPA) Level IV Ecoregions of the Conterminous United States: Black Hills Plateau—17b Black Hills Core Highlands—17c USDA Forest Service Ecological Subregions: Sections and Subsections of Conterminous United States: Black Hills Coniferous Forest Province—M334: Black Hills Section—334A Black Hills Limestone Plateau-Core Highlands Subsection—M334Ab

Ecological site concept

The Wet Subirrigated ecological site is found throughout MLRA 62. It is a run-in site located on nearly level alluvial fans, stream terraces, and floodplains. The slopes range from 0 to 3 percent. The soils are very deep and formed in loamy or clayey alluvium of mixed origin. Soils are somewhat poorly drained, with moderate to moderately slow permeability. A seasonal water table occurs within 1 to 2 feet of the surface. The site is non-saline and non-alkaline. Vegetation in the Reference State (1.0) is dominated by tall and mid-stature warm- and cool-season grasses and grass-like species. Forbs are common and diverse. Shrub patches can be extensive, and trees can be scattered across the site.

Associated sites

R062XA020SD	**Loamy Overflow - North** The Loamy Overflow ecological site is found adjacent to a stream channel. It can also be adjacent to or immediately below the Wet Subirrigated ecological site.
R062XY003SD	**Subirrigated** The Subirrigated ecological site is found adjacent to or intermixed with the Wet Subirrigated ecological site. The Subirrigated ecological site has a deeper permanent water table (2-5 feet) compared to the Wet Subirrigated ecological site(1-2 feet).

Similar sites

R062XY003SD	**Subirrigated** The Subirrigated ecological will have more warm-season grasses and fewer shrubs than the Wet Subirrigated ecological site.
R062XA020SD	**Loamy Overflow - North** The Loamy Overflow ecological site, both in the northern and southern Black Hills, will have more cool-season grasses, scattered trees, and lower vegetative production than the Wet Subirrigated ecological site.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Salix bebbiana*
Herbaceous	(1) *Spartina pectinata* (2) *Calamagrostis canadensis*

Physiographic features

The Wet Subirrigated ecological site occurs on nearly level alluvial fans, stream terraces, and floodplains.. A permanent water table occurs within 1 to 2 feet of the surface and persists longer than the wettest part of the growing season, typically extending through the

month of July.

Table 2. Representative physiographic features

Landforms	(1) Valley > Flood plain (2) Stream terrace (3) Alluvial fan
Runoff class	Negligible to low
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Occasional to frequent
Ponding frequency	None
Elevation	880 – 1,520 m
Slope	0 %
Water table depth	30 – 60 cm
Aspect	Aspect is not a significant factor

Climatic features

MLRA 62 is in a microclimate caused by the influence of increased elevation, which leads to increased precipitation, moderate air temperature, and lower wind velocities as compared to the surrounding Great Plains. In general, the Black Hills climate is a continental type: cold in the winter and hot in the summer.

Annual precipitation in MLRA 62 typically increases with elevation and decreases from west to east and from north to south. The average annual precipitation range for MLRA 62 is 18 to 35 inches. Most of the rainfall occurs as frontal storms early in the growing season, in May and June. Some high-intensity, convective thunderstorms occur in July and August. Precipitation in the winter occurs mostly as snow. Twenty to 40 percent of the annual precipitation falls as snow. The annual average snowfall ranges from 23 inches at the lower elevations in the south, to 54 inches in the higher elevations of the central core of the Black Hills.

The average annual temperature varies from 36°F to 48°F. January is the coldest month, with an average temperature of 22°F in the higher elevation of the central core, and 25°F in the southern part of MLRA 62. July is the warmest month, with an average daily temperature of 67°F in the central core, and 73°F in the southern part of this MLRA. The frost-free period ranges from 143 to 168 days. It is shortest at higher elevations and in the northwestern part of the MLRA. Hourly winds are estimated to average about 11 miles per hour (mph) annually.

Growth of cool-season plants begins in April, slowing or ceasing growth by mid-August. Warm-season plants begin growth in May and continue to mid-September. Regrowth of cool-season plants may occur in September and October, depending upon soil moisture availability.

The average annual precipitation range for MLRA 62 is 18 to 35 inches.

Table 3 Representative climatic features

Frost-free period (characteristic range)	70-110 days
Freeze-free period (characteristic range)	110-120 days
Precipitation total (characteristic range)	480-760 mm
Frost-free period (actual range)	30-110 days
Freeze-free period (actual range)	70-130 days
Precipitation total (actual range)	460-760 mm
Frost-free period (average)	80 days
Freeze-free period (average)	110 days
Precipitation total (average)	580 mm

- (1) LEAD [USC00394834], Lead, SD
- (2) DEADWOOD 2NE [USC00392209], Whitewood, SD
- (3) DEERFIELD 3 SE [USC00392231], Hill City, SD
- (4) MT RUSHMORE NATL MEM [USC00395870], Keystone, SD
- (5) PACTOLA DAM [USC00396427], Rapid City, SD
- (6) CUSTER CO AP [USW00094032], Custer, SD
- (7) EDGEMONT 23 NNW [USC00392565], Custer, SD
- (8) WIND CAVE [USC00399347], Buffalo Gap, SD
- (9) DEADWOOD [USC00392207], Deadwood, SD

Influencing water features

Riparian areas and wetland features can be directly associated with the Wet Subirrigated ecological site.

Wetland description

Stream Type: B6, C6
(Rosgen System)

Soil features

Soils common to the Wet Subirrigated ecological site are very deep and formed in alluvium. Subsurface textures are coarse to moderately fine, with some sites containing up to 15 percent rocks in the subsoil. Soils are somewhat poorly drained with moderate to moderately slow permeability. Water-holding capacity is high. These soils have a high water table (1 to 2 feet from the surface) which keeps the rooting zone moist for an extended portion of the growing season. Salinity is none to slight, and sodicity typically is none to slight. Subsurface soil layers are not restrictive to water movement or root penetration.

This site should show no evidence of rills, wind-scoured areas, or pedestalled plants. No water flow patterns are seen on this site. The soil surface is stable and intact.

Major soil correlated to the Wet Subirrigated ecological site is Marshbrook

Marshbrook soil is also correlated to the Subirrigated ecological site (R062XY003SD) if the permanent water table is within 2 to 5 feet of the surface.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases where vegetative cover is not adequate. A drastic loss of the soil surface layer on this site can result in a shift in species composition and production.

More information regarding the soil is available in soil survey reports. Contact the local USDA Service Center for details specific to your area of interest, or go online to access USDA's Web Soil Survey.

Table 4. Representative soil features

Parent material	(1) Alluvium – igneous and metamorphic rock
Surface texture	(1) Loam (2) Clay loam
Family particle size	(1) Loamy
Drainage class	Somewhat poorly drained
Permeability class	Moderate to moderately slow
Depth to restrictive layer	200 cm
Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	15.24 – 17.78 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 30 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10

Soil reaction (1:1 water) (0-101.6cm)	6.6 – 8.4
Subsurface fragment volume <=3" (0-101.6cm)	0 – 20 %
Subsurface fragment volume >3" (0-101.6cm)	0 – 10 %

Ecological dynamics

The Wet Subirrigated ecological site evolved under Black Hills climatic conditions; light to severe grazing by bison, elk, insects, and small mammals; beaver activities; sporadic, natural or human-caused wildfire (often of light intensities); and other biotic and abiotic factors that typically influence soil and site development. Changes occur in the plant communities due to short-term weather variations, fluctuating water table depth and hydrologic systems, effects of native and non-native plant and animal species, and management actions. Severe disturbances, such as periods of well below-average precipitation, severe defoliation, excessive haying, or non-use and no fire can cause significant shifts in plant communities and species composition.

Placer mining activities during the Black Hills gold rush of the 1870s and 1880s had severe effects in some riparian areas, as did transportation routes along streams, and the expansion of agriculture purposes including farming and livestock production that supplied beef and mutton for mining communities (Froiland, 1990).

In addition, long-term fire suppression following Euro-American settlement of the Black Hills has allowed ponderosa pine on upland forest sites to expand dramatically. Of the average annual precipitation in the Black Hills area, approximately 91.6 percent is returned to the atmosphere via evapotranspiration, about 4.9 percent becomes runoff from the land surface, and about 3.5 percent recharges major Black Hills aquifers (Carter, et al., 2002). These stands of pine also reduce localized aquifer recharge, resulting in drier valley floors and riparian areas.

Interpretations are primarily based on the Prairie Cordgrass-Bluejoint Reedgrass/Nebraska Sedge/Shrubs Plant Community (1.1). It has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily to lightly grazed areas, seasonal use pastures, and historical accounts also have been used. Plant community phases, states, transitional pathways, and thresholds have been determined through similar studies and experience.

It may be difficult to locate the Reference Plant Community (1.1) with the spread and establishment of non-native cool-season grasses in MLRA 62. The Native/Invaded State (2.0) is more representative of current conditions than the Reference State (1.0). Because of the persistence of non-native cool-season grasses, a restoration pathway to the Reference State (1.0) is not believed to be achievable.

The following state-and-transition diagram illustrates the common plant communities on the site and the transition pathways between communities. The ecological processes are discussed in more detail in the plant community descriptions following the diagram.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**Tall and Mid- Warm-Season Grasses**			1547-2578	
	prairie cordgrass	SPPE	*Spartina pectinata*	1547-2578	–
	switchgrass	PAVI2	*Panicum virgatum*	0-103	–

	big bluestem	ANGE	*Andropogon gerardii*	0-103	–
	marsh muhly	MURA	*Muhlenbergia racemosa*	52-103	–
	Indiangrass	SONU2	*Sorghastrum nutans*	0-52	–
2	**Cool-Season Rhizomatous Grasses**			773-1547	
	bluejoint	CACA4	*Calamagrostis canadensis*	258-1031	–
	northern reedgrass	CASTI3	*Calamagrostis stricta ssp. inexpansa*	258-516	–
	reed canarygrass	PHAR3	*Phalaris arundinacea*	0-258	–
	western wheatgrass	PASM	*Pascopyrum smithii*	103-258	–
	plains bluegrass	POAR3	*Poa arida*	52-103	–
	fowl mannagrass	GLST	*Glyceria striata*	0-103	–
3	**Cool-Season Bunchgrasses**			52-258	
	fowl bluegrass	POPA2	*Poa palustris*	52-258	–
	inland bluegrass	PONEI2	*Poa nemoralis ssp. interior*	52-258	–
	American sloughgrass	BESY	*Beckmannia syzigachne*	0-103	–
4	**Other Native Grasses**			0-69	
	Grass, perennial	2GP	*Grass, perennial*	0-103	–
5	**Grass-Likes**			516-1289	
	Nebraska sedge	CANE2	*Carex nebrascensis*	258-1031	–
	inland sedge	CAIN11	*Carex interior*	103-516	–
	Hood's sedge	CAHO5	*Carex hoodii*	0-258	–
	bulrush	SCHOE6	*Schoenoplectus*	0-258	–
	clustered field sedge	CAPR5	*Carex praegracilis*	0-258	–
	rush	JUNCU	*Juncus*	0-258	–
	scouringrush horsetail	EQHY	*Equisetum hyemale*	0-258	–
	wheat sedge	CAAT2	*Carex atherodes*	0-258	–
	spikerush	ELEOC	*Eleocharis*	52-258	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	52-258	–
6	**Non-Native Cool-Season Grasses**			0	
Forb					
7	**Forbs**			258-1031	
	American licorice	GLLE3	*Glycyrrhiza lepidota*	52-258	–
	cinquefoil	POTEN	*Potentilla*	52-258	–
	goldenrod	SOLID	*Solidago*	52-258	–
	Forb, native	2FN	*Forb, native*	52-258	–
	white prairie aster	SYFA	*Symphyotrichum falcatum*	0-155	–
	white water crowfoot	RAAQ	*Ranunculus aquatilis*	0-103	–
	Indianhemp	APCA	*Apocynum cannabinum*	0-103	–
	mint	MENTH	*Mentha*	0-103	–
	Pennsylvania smartweed	POPE2	*Polygonum pensylvanicum*	0-103	–
	plantain	PLANT	*Plantago*	0-103	–
	poison hemlock	COMA2	*Conium maculatum*	0-103	–
	Rocky Mountain iris	IRMI	*Iris missouriensis*	0-103	–
	swamp milkweed	ASIN	*Asclepias incarnata*	0-103	–
	swamp smartweed	POHY2	*Polygonum hydropiperoides*	0-103	–
	broadleaf cattail	TYLA	*Typha latifolia*	0-52	–
	water hemlock	CICUT	*Cicuta*	0-52	–

Shrub/Vine					
8	**Shrubs**			258-516	
	Bebb willow	SABE2	*Salix bebbiana*	258-516	–
	redosier dogwood	COSE16	*Cornus sericea*	52-258	–
	blackberry	RUBUS	*Rubus*	52-103	–
	sandbar willow	SAIN3	*Salix interior*	0-103	–
	shrubby cinquefoil	DAFRF	*Dasiphora fruticosa ssp. floribunda*	0-103	–
	Woods' rose	ROWO	*Rosa woodsii*	52-103	–
	yellow willow	SALU2	*Salix lutea*	52-103	–
	currant	RIBES	*Ribes*	52-103	–
	diamondleaf willow	SAPL2	*Salix planifolia*	0-103	–
	meadow willow	SAPE5	*Salix petiolaris*	0-52	–
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0-52	–
	river birch	BENI	*Betula nigra*	0-52	–
Tree					
9	**Trees**			0-103	
	peachleaf willow	SAAM2	*Salix amygdaloides*	0-103	–
	Tree	2TREE	*Tree*	0-52	–

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 8. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 9. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 10. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 11. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Animal community

The Black Hills and Bear Lodge Mountains of South Dakota and Wyoming are truly a forested island in a grassland sea. To regional Native Americans they are “Paha Sapa,” or “hills that are black”, and from a distance, the ponderosa pine-covered slopes do appear like black hills (Larson, 1999). The Black Hills and Bear Lodge Mountains are located in the drier areas of a northern mixed-grass prairie ecosystem in which sagebrush steppes to the west yield to grassland steppes to the east. Prior to European settlement, MLRA 62 consisted of diverse grassland, shrubland, and forest habitats interspersed with varying densities of depressional instream wetlands and woody riparian corridors. These habitats provided critical life cycle components for many users. Many species of grassland birds, small mammals, reptiles, amphibians, and herds of roaming bison, elk, and pronghorn were among the inhabitants adapted to this semi-arid region. Roaming herbivores, as well as several species of small mammals and insects, were the primary consumers linking the grassland resources to large predators, such as the gray wolf, mountain lion, grizzly bear, and to smaller carnivores, such as the coyote, bobcat, fox, and raptors. Beaver inhabited surface waters associated with instream wetlands and woody riparian corridors along streams and drainages. Beaver occupation served as a mechanism to maintain water tables along flood plains and valley floors. During pre-European settlement times, the extent of the wet land sites was likely much more widespread and persistent during dry periods; however, excessive trapping and removal since that time has changed the hydrology and limited the extent of these sites while drying former mesic areas

throughout the MLRA. Grazing Interpretations Production and accessibility of plant communities described in the Wet Subirrigated ecological site can be highly variable. A complete resource inventory is necessary to document plant composition and production. Accurate estimates of carrying capacity should be calculated using vegetative clipping data, animal preference data, and actual stocking records. Initial suggested stocking rates should be calculated using a base of 912 lb/acre (air-dry weight) per animal-unit-month (AUM). An AUM is defined as the equivalent amount of forage required by a 1,000-pound cow with or without calf, for one month. Use a 25 percent harvest efficiency of preferred and desirable forage species (refer to USDA-NRCS National Range and Pasture Handbook). Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage for livestock. During the dormant period, the forage for livestock likely has insufficient protein to meet livestock requirements. Added protein allows ruminants to better utilize the energy stored in grazed plant materials. A forage quality test should be used to determine the level of supplementation needed.

Hydrological functions

This site is dominated by soils in hydrologic groups B and D. Infiltration and runoff potential for this site varies from low to negligible. Refer to the USDA-NRCS National Engineering Handbook, Part 630, for hydrologic soil groups, runoff quantities, and hydrologic curves.

Recreational uses

This site provides opportunities for hunting, hiking, photography, and bird watching. The wide variety of plants that bloom from spring until fall have an aesthetic value that appeals to visitors.

Wood products

No appreciable wood products are typically present on this site.

Other products

Harvesting the seeds of native plants on this site can provide additional income.

Other information

Revision Notes: Provisional This provisional ecological site description (ESD) has passed quality control (QC) and quality assurance (QA) to ensure that it meets the 2014 National Ecological Site Handbook (NESH) standards for a provisional ecological site description. This site description should not be considered an Approved ESD, as it contains only the foundational site concepts and requires further data collection, site investigations, and final State-and-Transition Model (STM) reviews before it can be used as an Approved ESD meeting NESH standards. Site Development and Testing Plan Future work, as described in an official project plan, is necessary to validate the information in this provisional ecological site description. The plan will include field activities for low-, medium-, and high-intensity sampling, soil correlations, and analysis of the data. Annual field reviews should be done by soil scientists and vegetation specialists. Final field review, peer review, quality control, and quality assurance reviews are required to produce the final document.

Inventory data references

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range-trained personnel were also used. Those involved in developing this site include: Stan Boltz, range management specialist (RMS), NRCS; Dan Brady, soil scientist (SS), NRCS; Mitch Faulkner, RMS, NRCS; Rick Peterson, (RMS), NRCS; Mathew Scott, RMS, USFS; and Jim Westerman, (SS), NRCS. All inventory information and data records are compiled within the Rapid City, SD USDA-NRCS Shared “S” network drive.

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Approval

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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)	
Contact for lead author	
Date	08/14/2026
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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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):**

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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:**
