USDA Natural Resources
Conservation Service

Ecological site R058AE192MT
Coarse Clay (CC) RRU 58A-E 10-14" 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.

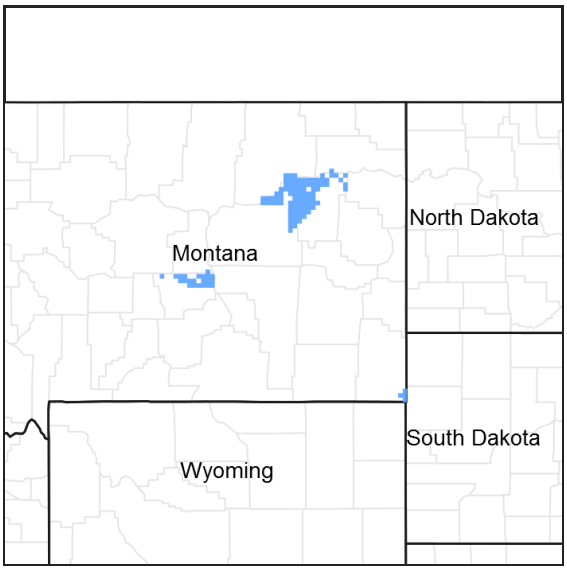


Figure 1. Mapped extent

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

R058AE002MT	**Clayey (Cy) RRU 58A-E 10-14" p.z.**
R058AE005MT	**Clayey-Steep (CyStp) RRU 58A-E 10-14" p.z.**
R058AE015MT	**Shale (Sh) RRU 58A-E 10-14" p.z.**
R058AE199MT	**Shallow Clay (SwC) RRU 58A-E 10-14" p.z.**

Similar sites

R058AE003MT	**Sandy (Sy) RRU 58A-E 10-14" p.z.** The Sandy site often has a somewhat similar plant community, but is much more productive, plus it occurs on sandy soils instead of shales.
R058AE199MT	**Shallow Clay (SwC) RRU 58A-E 10-14" p.z.** The Shallow Clay site differs by having a different plant community (western wheatgrass, green needlegrass).
R058AE015MT	**Shale (Sh) RRU 58A-E 10-14" p.z.** The Shale site differs by being very sparse, having low production, and having a much different plant community (western wheatgrass, Nuttall's saltbush).

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This ecological site occurs on hills and plains in shale uplands. This site occurs on all exposures and aspect is not significant. This site is associated with hard, acidic shales that act like sand (dunes can occur). Outcroppings of the shales are common.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Hill
Elevation	1,900–3,500 ft
Slope	0–25%
Aspect	Aspect is not a significant factor

Climatic features

MLRAs 58A and 60B are considered to have a continental climate characterized by cold winters, hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature are typical. The climate is the result of this MLRA's location in the geographic center of North America. There are few natural barriers on the northern Great Plains and the winds move freely across the plains and account for rapid changes in temperature. Seasonal precipitation is often limiting for plant growth. Annual fluctuations in species composition and total production are typical depending on the amount and timing of rainfall.
Temperatures can be very extreme in this part of Montana. Summer daytime temperatures are typically quite warm, generally averaging in the mid to upper 80º's F for July and August. Summertime temperatures will typically reach in the 100º's F at some point during the summer, and can reach 90º F any month between May and September. Conversely, winter temperatures can be cold, averaging in the mid teens to mid 20º's F for December and January. There will typically be several days of below zero temperatures each winter. It is not uncommon for temperatures to reach 30–40º F below zero, or even colder, most any winter.

Spring can be windy throughout these MLRA's, with winds averaging over 10 mph about 15 percent of the time. Speeds of 50 mph or stronger can occasionally occur as a weather system crosses this part of Montana.

MLRAs 58AE and 60BE have been divided into two distinct precipitation zones for the purpose of developing ecological site descriptions: 10–14" Mean Annual Precipitation (MAP) and 15–19" MAP.

10–14 inch zone:

The majority of the rangeland in these areas falls within the 11 to 13 inch range. During an average year, 70 to 75 percent of the annual precipitation falls between April and September, which are the primary growing season months.

Snowfall is not heavy in the area, averaging 28 total inches in the 10-14 inch MAP (Yellowstone Valley). Heavy snowfall occurs infrequently, usually late in the winter or early spring. Snow cover is typically 1 to 3 inches.

The frost free (32º F.) season averages about 105 to 145 days each year in the uplands, to nearly 170 days along the Yellowstone River Valley.

For local climate station information, refer to http://www.wcc.nrcs.usda.gov/cgibin/state.pl?state=mt.

Table 3. Representative climatic features

Frost-free period (average)	145 days
Freeze-free period (average)	170 days
Precipitation total (average)	14 in

Influencing water features

Soil features

Soils are often dark colored due to the color of the shale parent material. There may be up to 60% shale fragments in the upper part of the soil. The characteristics of the shales cause these soils to respond similar to sand and have a similar plant community composition. However, they are significantly
less productive.

Table 4. Representative soil features

Surface texture	(1) Silty clay loam (2) Silty clay (3) Clay
Drainage class	Well drained
Permeability class	Moderately slow to moderate
Soil depth	10–40 in
Available water capacity (0-40in)	0–4 in
Electrical conductivity (0-40in)	0–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0–13
Soil reaction (1:1 water) (0-40in)	3.5–6.5

Ecological dynamics

This site developed under Northern Great Plains climatic conditions, which included the natural influence of large herbivores and occasional fire. The plant community upon which interpretations are primarily based is the Historic Climax Plant Community (HCPC). This community is described as a reference to understand the original potential of this site, and is not always considered to be the management goal for every acre of rangeland. The following descriptions should enable the landowner or manager to better understand which plant communities occupy their land, and assist with setting goals for vegetation management. It can also be useful to understand the environmental and economic values of each plant community.

This site is considered moderately resilient to disturbance as it has moderate to high soil limitations for plant growth. Changes may occur to the Historic Climax Plant Community due to management actions and/or climatic conditions. Under continued adverse impacts, a moderate decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments this site can more readily return to a community that resembles the Historic Climax Plant Community.

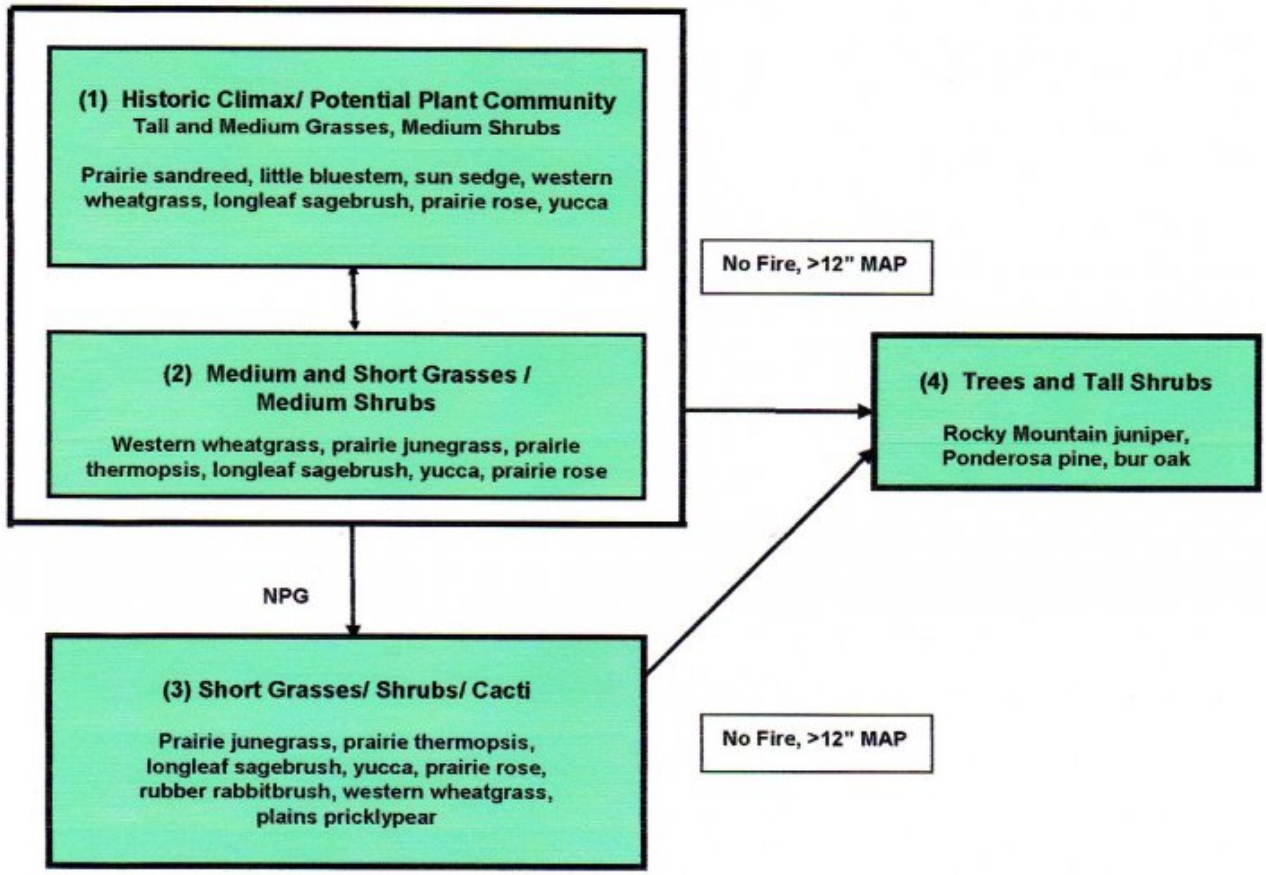
Continual adverse impacts to the site over a period of years results in a departure from the HCPC, with a decrease of the taller, more palatable species such as prairie sandreed, little bluestem, and sun sedge. These plants will be replaced by western wheatgrass, prairie junegrass, threadleaf sedge, forbs such
as prairie thermopsis, and shrubs such as prairie rose, longleaf sagebrush, and yucca. Continued deterioration results in a community of similar species, but with a shift in dominance. Short grasses, shrubs and forbs will make up most of the community at this stage.

Plants that are not a part of the climax community that are most likely to invade are annual bromes and broom snakeweed.

State and transition model

MLRA: 58A – Sedimentary Plains, East
MLRA: 60B – Pierre Shale Plains, East
R058AE192MT, R060BE567MT

Plant Communities and Transitional Pathways (diagram)



Smaller boxes within a larger box indicate that these communities will normally shift among themselves with slight variations in precipitation and other disturbances. Moving outside the larger box indicates the community has crossed a threshold (heavier line) and will require intensive treatment to return to Community 1 or 2. Dotted lines indicate a reduced probability for success.

NOTE: Not all species present in the community are listed in this table. Species listed are representative of the plant functional groups that occur in the community.

PG = Prescribed Grazing: Use of a planned grazing strategy to balance animal forage demand with available forage resources. Timing, duration, and frequency of grazing are controlled and some type of grazing rotation is applied to allow for plant recovery following grazing.

NPG = Non-Prescribed Grazing: Grazing which has taken place that does not control the factors as listed above, or animal forage demand is higher than the available forage supply.

Fire: Non-prescribed wildfire.

State 1
Plant Community 1: Tall and Medium Grasses/ Medium Shrubs

Community 1.1
Plant Community 1: Tall and Medium Grasses/ Medium Shrubs

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC) for this site. This plant community is dominated by species that also commonly occur on a sandy site. Warm season grasses such as prairie sandreed and little bluestem are major components. Cool season species such as sun sedge, prairie junegrass and western wheatgrass are the major sub-dominants. Few forbs occur on this site, with prairie thermopsis being the main one. A number of shrubs occur in small percentages, including longleaf sagebrush, prairie rose, yucca, rubber rabbitbrush, and Wyoming big sagebrush. Bur oak (extreme SE Montana, only), Ponderosa pine, and Rocky Mountain juniper are often common. Plants on this site have strong, healthy root systems that allow production to increase with favorable precipitation. This plant community provides for soil stability and a functioning hydrologic cycle. Plant litter is available for soil buildup and moisture retention.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	200	480	720
Shrub/Vine	38	90	135
Forb	12	30	45
Total	**250**	**600**	**900**

Table 6. Ground cover

Tree foliar cover	0-10%
Shrub/vine/liana foliar cover	5-10%
Grass/grasslike foliar cover	30-50%
Forb foliar cover	1-5%
Non-vascular plants	0%
Biological crusts	0-1%
Litter	0%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Table 7. Soil surface cover

Tree basal cover	1-2%
Shrub/vine/liana basal cover	1-2%
Grass/grasslike basal cover	3-7%
Forb basal cover	1-2%
Non-vascular plants	0%
Biological crusts	0-1%
Litter	15-25%
Surface fragments >0.25" and <=3"	0-4%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	60-80%

Table 8. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	–	–	–
>0.5 <= 1	–	–	–	–
>1 <= 2	–	5-10%	30-50%	1-5%
>2 <= 4.5	–	–	–	–
>4.5 <= 13	–	–	–	–
>13 <= 40	0-10%	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

State 2
Plant Community 2: Medium and Short Grasses/ Medium Shrubs

Community 2.1
Plant Community 2: Medium and Short Grasses/ Medium Shrubs

Slight variations in the historical climax plant community result in a community where the taller, warm season grasses are reduced, and cool season medium and short grasses, western wheatgrass and prairie junegrass replace them. Forbs and shrubs begin to occupy a larger part of the community, such as prairie thermopsis, longleaf sagebrush, yucca, and prairie rose. Grass biomass production and litter become reduced on the site as the taller grasses disappear, increasing evaporation and reducing moisture retention. Additional open space in the community can result in undesirable invader species. This plant community provides for moderate soil stability.

State 3
Plant Community 3: Short Grasses/ Shrubs/ Cacti

Community 3.1
Plant Community 3: Short Grasses/ Shrubs/ Cacti

With continued heavy disturbance on community 2, it tends to shift so the taller species become a very small part of the community. Medium grasses are no longer dominant, being replaced with short grasses, such as prairie junegrass. There is a corresponding increase in the amount of the forbs and shrubs, such as prairie thermopsis, longleaf sagebrush, yucca, prairie rose, rubber rabbitbrush, western wheatgrass, and plains pricklypear. . Plant Community 3 is less productive than Plant Community 1 or 2. The lack of litter and short plant heights result in higher soil temperatures, poor water infiltration rates, and high evaporation. This community has lost many of the attributes of a healthy rangeland, including good infiltration, minimal erosion and runoff, nutrient cycling and energy flow. Rest and seeding will be required to bring this site back across the ecological stability threshold. Because the soils associated with this site are very susceptible to blowing, special precautions will be needed when seeding. Using a cover crop, generally large seeded, warm season annuals (e.g., foxtail millet, sorghum-sudan grass) is usually necessary when trying to reseed these sandy soils.

State 4
Plant Community 4: Trees and Tall Shrubs

Community 4.1
Plant Community 4: Trees and Tall Shrubs

In the absence of fire, probably coupled with non-prescribed grazing, this community can shift to one that is nearly all Rocky Mountain juniper, Ponderosa pine, and/or bur oak. There is typically very little understory vegetation in this situation, primarily because of the droughty nature of the soils. When the canopy cover of trees exceeds 10%,

the Forest Grazing Guide, "Ponderosa Pine Series, Dry Environment," should be used.

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Native grasses and sedges**			200–630	
	prairie sandreed	CALO	*Calamovilfa longifolia*	75–450	–
	little bluestem	SCSCS	*Schizachyrium scoparium var. scoparium*	38–360	–
	sun sedge	CAINH2	*Carex inops ssp. heliophila*	25–135	–
	western wheatgrass	PASM	*Pascopyrum smithii*	12–90	–
2	**Native grasses and sedges**			2–90	
	Grass, perennial	2GP	*Grass, perennial*	2–45	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	2–45	–
	threadleaf sedge	CAFI	*Carex filifolia*	2–45	–
	plains reedgrass	CAMO	*Calamagrostis montanensis*	2–45	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	2–45	–
	Sandberg bluegrass	POSE	*Poa secunda*	2–45	–
Forb					
3	**Native forbs**			12–45	
	Forb, perennial	2FP	*Forb, perennial*	2–45	–
	common yarrow	ACMI2	*Achillea millefolium*	2–45	–
	onion	ALLIU	*Allium*	2–45	–
	tarragon	ARDR4	*Artemisia dracunculus*	2–45	–
	bastard toadflax	COUM	*Comandra umbellata*	2–45	–
	buckwheat	ERIOG	*Eriogonum*	2–45	–
	dotted blazing star	LIPU	*Liatris punctata*	2–45	–
	prairie thermopsis	THRH	*Thermopsis rhombifolia*	2–45	–
	American vetch	VIAM	*Vicia americana*	2–45	–
Shrub/Vine					
4	**Native shrubs and half-shrubs**			38–135	
	Shrub, broadleaf	2SB	*Shrub, broadleaf*	2–90	–
	longleaf wormwood	ARLO7	*Artemisia longifolia*	2–90	–
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	2–90	–
	slender buckwheat	ERMI4	*Eriogonum microthecum*	2–90	–
	rubber rabbitbrush	ERNAN5	*Ericameria nauseosa ssp. nauseosa var. nauseosa*	2–90	–
	creeping juniper	JUHO2	*Juniperus horizontalis*	2–90	–
	skunkbush sumac	RHTR	*Rhus trilobata*	2–90	–
	prairie rose	ROAR3	*Rosa arkansana*	2–90	–
	soapweed yucca	YUGL	*Yucca glauca*	2–90	–

Animal community

Livestock Grazing Interpretations:

Managed livestock grazing is suitable on this site as it has the potential to produce a moderate amount of high quality forage. Management objectives should include maintenance or improvement of the plant community. Shorter grazing periods and adequate re-growth after grazing are recommended for plant maintenance and recovery. Heavy stocking and season long use of this site can be detrimental and will alter the plant community composition and production over time.

Whenever Plant Community 2 occurs (medium and short grasses), grazing management strategies need to be implemented to avoid further deterioration. This community is still stable, productive, and healthy provided it receives proper management. This community will respond fairly quickly to improved grazing management including increased growing season rest of key forage plants. Grazing management alone can usually move this community back to one more similar to potential if a good seed source of the taller grasses still exists.

Plant Community 3 has much less forage production than Communities 1 or 2, (< 275 pounds per acre). In this community many of the dominant species are not preferred by livestock.

Plant Community 4 has practically no grazing value for livestock, as it is comprised primarily of trees and shrubs.

Once this site is occupied by either Plant Community 3 or 4, it will be more difficult to restore it to a community that resembles the potential with grazing management alone. Additional growing season rest is often necessary for re-establishment of the desired species and to restore the stability and health of the site. Seeding will generally be required to bring this site back across the ecological stability threshold.

Wildlife Interpretations:

The following is a description of habitat values for the different plant communities that may occupy the site:

Plant Community 1: Tall and Medium Grasses/ Medium Shrubs (HCPC):
Although this community has relatively low productivity, the diversity of warm and cool season grasses and sedges, forbs, shrubs and half-shrubs provides a high plane of nutrition for grazers and mixed feeders throughout the growing season and beyond. Mule deer and pronghorn will use the variety of browse species throughout the year. Ground-nesting bird habitat value is limited because of the high proportion of bare soil. Common nighthawks may nest on the sparsely covered surface. Scattered pines, junipers and bur oak provide valuable habitat for a variety of raptors and songbirds including American kestrels, Townsend’s solitaires, chipping sparrows, field sparrows, lark sparrows and white-crowned sparrows. Mountain bluebirds may nest in tree cavities and mourning doves on tree branches. Small mammal populations are dominated by seed-eaters such as deer mice.

Plant Community 2: Medium and Short Grasses/ Medium Shrubs:
The loss of warm season grasses and palatable forbs shortens the season of high nutrition for grazers and mixed feeders. Structural habitat diversity for a wide range of non-game species is also decreased. An increase in shrubs and half-shrubs provides seasonal browse for mule deer and pronghorn.

Plant Community 3: Short Grasses/ Shrubs/ Cacti:
General wildlife habitat values have declined significantly at this stage. Very little forage is available for ungulates, although an increase in shrubs and half-shrubs provides fall-spring browse for mule deer and pronghorn. Habitat structure has been greatly simplified which reduces small mammal and songbird diversity.

Plant Community 4: Trees and Tall Shrubs:
A significant increase in Ponderosa pine, Rocky Mountain juniper or, in some cases, bur oak, benefits some songbird species such as those listed in Plant Community 1, above. Ground-nesting bird and small mammal habitat values are very significantly reduced with the loss of ground cover.

Hydrological functions

The runoff potential for this site is moderate to very high depending on slope and ground cover/health. Runoff curve numbers generally range from 84 to 93. The soils associated with this ecological site are generally in Hydrologic Soil Group D. The infiltration rates for these soils will normally be moderate.

Good hydrologic conditions exist on rangelands if plant cover (grass, litter, and brush canopy) is greater than 70%. Fair conditions exist when cover is between 30 and 70%, and poor conditions exist when cover is less than 30%. Sites in high similarity to HCPC (Plant Community 1) generally have enough plant cover and litter to optimize infiltration, minimize runoff and erosion, and have a good hydrologic condition. The deep root systems of the potential vegetation help maintain or increase infiltration rates and reduce runoff.

Sites in low similarity (Plant Communities 3 and 4) are generally considered to be in poor hydrologic condition as the majority of plant cover is from shallow-rooted or tap-rooted species.

Erosion is minor for sites in high similarity. Rills and gullies should not be present. Water flow patterns, if present, will be barely observable. Plant pedestals are essentially non-existent. Plant litter remains in place and is not moved by erosion. Soil surfaces should not be compacted or crusted. Plant cover and litter helps retain soil moisture for use by the plants. Maintaining a healthy stand of perennial vegetation will optimize the amount of precipitation that is received. (Reference: Engineering Field Manual, Chapter 2 and Montana Supplement 4).

Recreational uses

This site provides recreational opportunities for big game and upland bird hunting, and hiking. The forbs have flowers that appeal to photographers. This site provides valuable open space and visual aesthetics.

Other information

The following is an example of how to calculate the recommended stocking rate. This example does not use production estimates from this specific ecological site. You will need to adjust the annual production values and run the calculations using total annual production values from the ecological sites encountered on each individual ranch/pasture. Before making specific recommendations, an on-site evaluation must be made.

Example of total annual production amounts by type of year:
Favorable years = 2200 lbs/acre
Normal years = 1480 lbs/acre
Unfavorable years = 1200 lbs/acre

It is recommended that on slopes of 30% or less, stocking rate should be derived from the total annual production pounds minus 500 pounds for residual dry matter and 25% harvest efficiency. On slopes over 30%, stocking rate is derived from total annual production pounds minus 800 pounds for residual dry matter and 25% harvest efficiency. Refer to the NRCS National Range and Pasture Handbook for a list of Animal Unit Equivalents.

Sample Calculations using Favorable Year production amounts:

< 30% slopes: AUM/AC = [(2200-500)(0.25)]/915 lbs/month for one AU = 0.46 AUM/AC
AC/AUM = (1.0 AU)/(0.46AUM/AC) = 2.2 AC/AUM

> 30% slopes: AUM/AC = [(2200-800)(0.25)]/915 lbs/month for one AU = 0.38 AUM/AC
AC/AUM = (1.0 AU)/(0.38 AUM/AC) = 2.6 AC/AUM

NOTE: 915 lbs/month for one Animal Unit is used as the baseline for maintenance requirements. This equates to 30 lbs/day of air-dry forage (1200 lb cow at 2.5% of body weight).

Inventory data references

NRCS-Production & Composition Record for Native Grazing Lands (Range-417): 8

BLM-Soil & Vegetation Inventory Method (SVIM) Data: 6

NRCS-Range Condition Record (ECS-2): 9

NRCS-Range/Soil Correlation Observations & Soil 232 notes: 13

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)	T. DeCock; R Kilian; K Kilwine
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Date	06/11/2014
Approved by	Jon Siddoway
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills should not be present.

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2. **Presence of water flow patterns:** Water flow paths are broken and irregular in appearance, discontinuous, with numerous debris dams.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals up to 0.25 inch high are common on slopes > 10%. On slopes greater than 10% Terracettes may be present but should be less than 0.25 inches high.

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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 is < 50%. Bare ground will occur as large areas of 6 – 8 inches in diameter.

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5. **Number of gullies and erosion associated with gullies:** Active gullies may be present on steeper slopes.

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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):** Plant litter movement is expected.

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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): Surface Soil Aggregate Stability under plant canopy should typically be 3 or greater. Surface Soil Aggregate Stability not under plant canopy should typically be 2 or slightly less.

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

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Moderate plant canopy and moderate gaps between plants help reduce raindrop impact and slow overland flow, providing increased time for infiltration to occur. A combination of shallow and deep rooted species has a positive effect on infiltration.

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** No compaction layer; light soil surface crusting can be expected.

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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: Warm season, tall-stature, rhizomatous grasses > Warm season, mid-stature, bunch grasses

    Sub-dominant: Shrubs and half shrubs = Cool season, short-stature, rhizomatous grasses and sedges = Cool season, mid-stature rhizomatous grasses

    Other: Minor components: Cool season, short-stature, bunch grasses and sedges = forbs = Warm season, mid-stature, bunch grasses

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Some plant mortality and decadence (10 to 15%) is expected on this site.

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14. **Average percent litter cover (%) and depth (in):** Litter cover is in contact with soil surface.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 750 to 900 #/acre (13 to 14 inch precip. Zone) 250 to 600 #/ac (10 to 12 inch precip. Zone).

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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:** Halogeton, Leafy spurge, knapweeds, whitetop, Dalmatian toadflax, yellow toadflax, St. Johnswort, perennial pepperweed, Yellow sweetclover.

17. **Perennial plant reproductive capability:** All species are capable of reproducing