USDA Natural Resources
Conservation Service

# Ecological site R058AC058MT
# Very Shallow (VSw) RRU 58A-C 11-14" p.z.

Last updated: 6/14/2023
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.

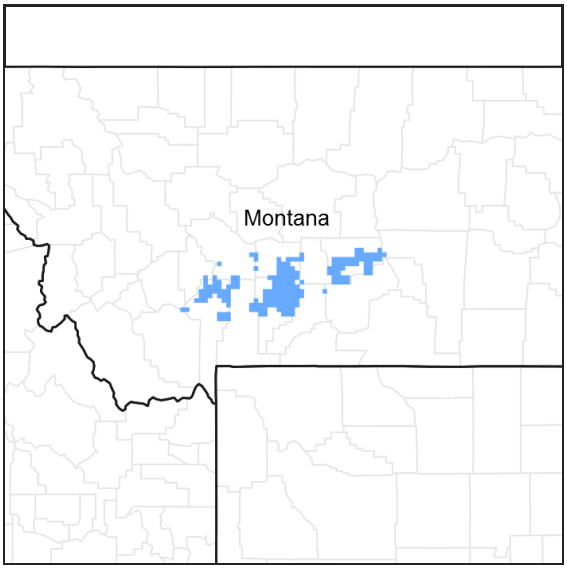



**Figure 1. Mapped extent**

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

| | |
|---|---|
| R058AC049MT | **Silty-Steep (SiStp) RRU 58A-C 11-14" p.z.** |
| R058AC059MT | **Shallow Clay (SwC) RRU 58A-C 11-14" p.z.** |

## Similar sites

| | |
|---|---|
| R058AC055MT | **Gravel (Gr) RRU 58A-C 11-14" p.z.**<br>The Gravel site differs mainly in depth or texture. |
| R058AC057MT | **Shallow (Sw) RRU 58A-C 11-14" p.z.**<br>The Shallow site differs by having a deeper soil profile over the root restricting layer and having significantly more production. |

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | Not specified |
| Shrub | Not specified |
| Herbaceous | Not specified |

## Physiographic features

Very Shallow sites occur on ridges and shoulders of hills. The sites occur on all aspects.

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Ridge<br>(2) Hill |
| Elevation | 2,250–4,500 ft |
| Slope | 2–70% |
| Water table depth | 60 in |
| Aspect | N, S, W |

## Climatic features

Major Land Resource Area (MLRA) 58AC in Montana is 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 this MLRA, 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.

The majority of the rangeland in MLRA 58AC is within the 11 to 14 inch Mean Annual Precipitation (MAP) 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 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) | 135 days |
| Freeze-free period (average) | 155 days |
| Precipitation total (average) | 14 in |

## Influencing water features

## Soil features

These soils are typically less than 10 inches deep to hard rock or soft beds of decomposed siltstone, sandstone, or shale. Soils that characterize this ecological site can include deep fragmental soils. Few roots penetrate deeper than 10 inches. Surface textures are variable. Cracks in the bedrock may allow deeper root penetration and have taller grasses, shrubs, or stunted trees. These soils are very droughty, having a total available water capacity of 2 inches or less.

**Table 4. Representative soil features**

| | |
|---|---|
| Soil depth | 1–10 in |
| Surface fragment cover <=3" | 15–25% |
| Available water capacity (0-40in) | 0–2 in |

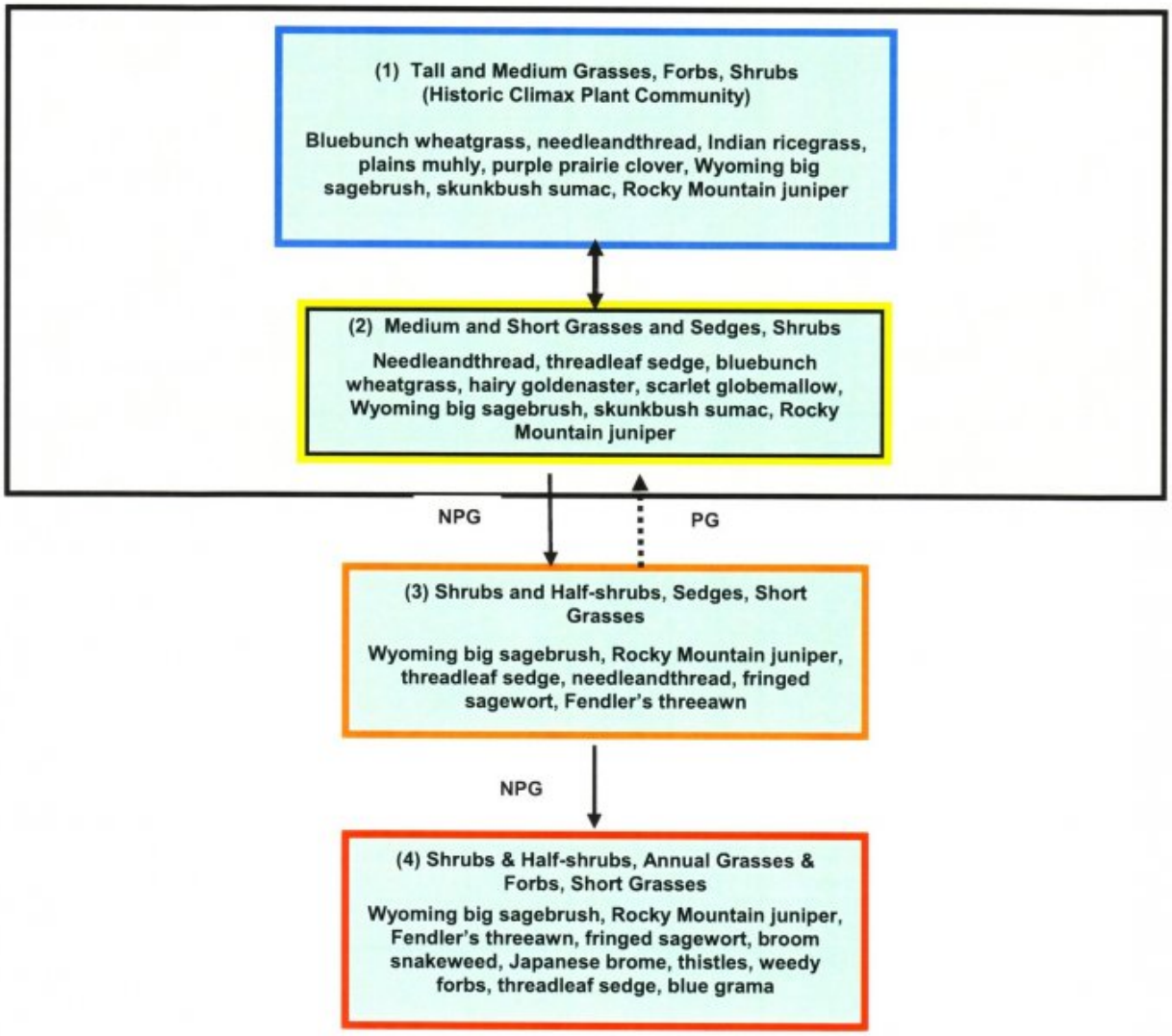
## Ecological dynamics

The following are descriptions of several plant communities that may occupy this site:

## State and transition model

MLRA: 58AC – Sedimentary Plains, Central
R058AC058MT

## 5c. 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. Yellow boxes indicate caution that the community may be in danger of crossing a threshold. Orange boxes represent communities that have crossed over thresholds from the HCPC and may be difficult to restore with grazing management alone. Red boxes represent communities that have severely shifted away from the HCPC and probably cannot be restored without mechanical inputs.

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.

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

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

The physical aspect of this site in the Historical Climax (HCPC) is that of a sparse grassland that is typically

dominated by medium and tall grasses and sedges with a scattered shrub cover. Approximately 60–70% of the annual production is from grasses and sedges, 1–5% from forbs, and 15–25% is from shrubs and half-shrubs. The canopy cover of shrubs is 0-15%. Dominant species include bluebunch wheatgrass, needleandthread, Indian ricegrass, and short grasses and sedges (Sandberg bluegrass, prairie junegrass, threadleaf sedge). There are abundant forbs (purple and white prairie clover, dotted gayfeather) which occur in smaller percentages. Shrubs such as skunkbush sumac and Wyoming big sagebrush are common. This plant community is well adapted to the Northern Great Plains climatic conditions. The diversity in plant species and the presence of tall, deep-rooted perennial grasses allows for moderately high drought tolerance, considering the limited available water holding capacity of the site. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). Plants on this site have strong, healthy root systems that allow production to increase significantly with favorable precipitation. Abundant plant litter is available for soil building and moisture retention. Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low. This plant community provides for soil stability and a functioning hydrologic cycle.

**Table 5. Annual production by plant type**

| Plant Type | Low (Lb/Acre) | Representative Value (Lb/Acre) | High (Lb/Acre) |
|---|---|---|---|
| Grass/Grasslike | 560 | 610 | 660 |
| Shrub/Vine | 110 | 125 | 140 |
| Forb | 80 | 90 | 100 |
| **Total** | **750** | **825** | **900** |

**Table 6. Ground cover**

| | |
|---|---|
| Tree foliar cover | 0% |
| Shrub/vine/liana foliar cover | 0-15% |
| Grass/grasslike foliar cover | 20-30% |
| Forb foliar cover | 1-5% |
| Non-vascular plants | 0% |
| Biological crusts | 0% |
| 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 | 0% |
| Shrub/vine/liana basal cover | 1-5% |
| Grass/grasslike basal cover | 3-10% |
| Forb basal cover | 1-4% |
| Non-vascular plants | 0% |
| Biological crusts | 1-5% |
| Litter | 30-50% |
| Surface fragments >0.25" and <=3" | 15-25% |
| Surface fragments >3" | 0% |
| Bedrock | 0% |

| | |
|---|---|
| Water | 0% |
| Bare ground | 25-50% |

**Table 8. Canopy structure (% cover)**

| Height Above Ground (Ft) | Tree | Shrub/Vine | Grass/ Grasslike | Forb |
|---|---|---|---|---|
| <0.5 | – | – | – | – |
| >0.5 <= 1 | – | 0-15% | – | 1-5% |
| >1 <= 2 | – | – | 20-30% | – |
| >2 <= 4.5 | – | – | – | – |
| >4.5 <= 13 | – | – | – | – |
| >13 <= 40 | – | – | – | – |
| >40 <= 80 | – | – | – | – |
| >80 <= 120 | – | – | – | – |
| >120 | – | – | – | – |

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

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

This community occurs due to minor climate shifts or slight variations in soils and/or topography or disturbance, including non-prescribed grazing. Dominants include needleandthread and threadleaf sedge. Most of the taller and more palatable grasses (bluebunch wheatgrass, Indian ricegrass) will still be present but in smaller amounts. Shrubs such as Wyoming big sagebrush and Rocky Mountain juniper become more common. Palatable and nutritious forbs will begin to be replaced by less desirable and more aggressive species such as hairy goldenaster, scurfpea species, and scarlet globemallow. Biomass production and litter become reduced on the site as the taller grasses disappear, increasing evaporation and reducing moisture retention. Additional open space in this community can result in undesirable invader species. This plant community provides for moderate soil stability.

## State 3
## Plant Community 3: Shrubs and Half-shrubs/ Sedges/ Short Grasses

### Community 3.1
### Plant Community 3: Shrubs and Half-shrubs/ Sedges/ Short Grasses

This is a disturbance induced community, with dominants including Rocky Mountain juniper, Wyoming big sagebrush, threadleaf sedge, perennial forbs, fringed sagewort, and blue grama. Undesirable species such as Fendler’s threeawn become more abundant. There may still be remnant amounts of some of the late and mid-seral species such as bluebunch wheatgrass, Indian ricegrass, and needleandthread present, usually underneath the shrubs. Palatable forbs will be mostly absent. Low growing, mat-like forbs become common. Crazyweed species also tend to significantly increase.

## State 4
## Plant Community 4: Shrubs and Half-shrubs/ Short Grasses/ Annual Grasses and Forbs

### Community 4.1
### Plant Community 4: Shrubs and Half-shrubs/ Short Grasses/ Annual Grasses and Forbs

This community is the result of continual adverse disturbances, and includes a shift to a community comprised primarily of shrubs such as Wyoming big sagebrush, Rocky Mountain and creeping juniper. Fendler’s threeawn,

threadleaf sedge, fringed sagewort, broom snakeweed, annuals (cheatgrass brome, six-weeks fescue), and weedy forbs (knapweeds, thistles) become prevalent. There may still be remnant amounts of some of the mid-seral species such as and needleandthread present. The taller grasses will occur only occasionally and usually underneath the shrubs. Palatable forbs will be mostly absent. Plant Communities 3 and 4 are much less productive than Plant Communities 1 or 2, and have lost many of the attributes of a healthy rangeland. The loss of deep perennial root systems reduces total available moisture for plant growth. Reduction of plant litter will result in higher surface soil temperatures and increased evaporation losses. Annual species are often aggressive and competitive with seedlings of perennial plants. These communities can respond positively to improved grazing management but it will take additional inputs to move it towards a community similar in production and composition to that of Plant Community 1 or 2.

## 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** | | | 455–595 | |
| | bluebunch wheatgrass | PSSP6 | *Pseudoroegneria spicata* | 280–552 | – |
| | Indian ricegrass | ACHY | *Achnatherum hymenoides* | 1–170 | – |
| | prairie sandreed | CALO | *Calamovilfa longifolia* | 1–128 | – |
| | tufted wheatgrass | ELMA7 | *Elymus macrourus* | 1–128 | – |
| | needle and thread | HECOC8 | *Hesperostipa comata ssp. comata* | 35–128 | – |
| | western wheatgrass | PASM | *Pascopyrum smithii* | 1–128 | – |
| | plains muhly | MUCU3 | *Muhlenbergia cuspidata* | 1–42 | – |
| 2 | **Native grasses and sedges** | | | 1–85 | |
| | Grass, perennial | 2GP | *Grass, perennial* | 1–42 | – |
| | blue grama | BOGR2 | *Bouteloua gracilis* | 1–42 | – |
| | needleleaf sedge | CADU6 | *Carex duriuscula* | 1–42 | – |
| | threadleaf sedge | CAFI | *Carex filifolia* | 1–42 | – |
| | plains reedgrass | CAMO | *Calamagrostis montanensis* | 1–42 | – |
| | prairie Junegrass | KOMA | *Koeleria macrantha* | 1–42 | – |
| | Sandberg bluegrass | POSE | *Poa secunda* | 1–42 | – |
| 3 | **Native grasses** | | | 1–3 | |
| | Fendler's threeawn | ARPUF | *Aristida purpurea var. fendleriana* | 1–3 | – |
| **Forb** | | | | | |
| 4 | **Native forbs** | | | 35–128 | |
| | Forb, perennial | 2FP | *Forb, perennial* | 35–42 | – |
| | common yarrow | ACMI2 | *Achillea millefolium* | 35–42 | – |
| | milkvetch | ASTRA | *Astragalus* | 35–42 | – |
| | Douglas' dustymaiden | CHDO | *Chaenactis douglasii* | 35–42 | – |
| | bastard toadflax | COUM | *Comandra umbellata* | 35–42 | – |
| | miner's candle | CRVI4 | *Cryptantha virgata* | 35–42 | – |
| | purple prairie clover | DAPU5 | *Dalea purpurea* | 35–42 | – |
| | buckwheat | ERIOG | *Eriogonum* | 35–42 | – |
| | hairy false goldenaster | HEVI4 | *Heterotheca villosa* | 35–42 | – |

| | | | | | |
|---|---|---|---|---|---|
| | dotted blazing star | LIPU | *Liatris punctata* | 35–42 | – |
| | lacy tansyaster | MAPIP4 | *Machaeranthera pinnatifida ssp. pinnatifida var. pinnatifida* | 35–42 | – |
| | branched false goldenweed | OOMU | *Oonopsis multicaulis* | 35–42 | – |
| | beardtongue | PENST | *Penstemon* | 35–42 | – |
| | spiny phlox | PHHO | *Phlox hoodii* | 35–42 | – |
| | bahia | PICRA3 | *Picradeniopsis* | 35–42 | – |
| | slimflower scurfpea | PSTE5 | *Psoralidium tenuiflorum* | 35–42 | – |
| | upright prairie coneflower | RACO3 | *Ratibida columnifera* | 35–42 | – |
| | scarlet globemallow | SPCO | *Sphaeralcea coccinea* | 35–42 | – |
| | stemless four-nerve daisy | TEACA2 | *Tetraneuris acaulis var. acaulis* | 35–42 | – |
| | prairie thermopsis | THRH | *Thermopsis rhombifolia* | 35–42 | – |
| | American vetch | VIAM | *Vicia americana* | 35–42 | – |
| 5 | **Native forbs (toxic properties)** | | | 1–3 | |
| | twogrooved milkvetch | ASBI2 | *Astragalus bisulcatus* | 1–3 | – |
| | larkspur | DELPH | *Delphinium* | 1–3 | – |
| | white locoweed | OXSE | *Oxytropis sericea* | 1–3 | – |
| | deathcamas | ZIGAD | *Zigadenus* | 1–3 | – |
| **Shrub/Vine** | | | | | |
| 6 | **Native shrubs** | | | 70–170 | |
| | Shrub, broadleaf | 2SB | *Shrub, broadleaf* | 7–42 | – |
| | silver sagebrush | ARCA13 | *Artemisia cana* | 7–42 | – |
| | prairie sagewort | ARFR4 | *Artemisia frigida* | 7–42 | – |
| | Wyoming big sagebrush | ARTRW8 | *Artemisia tridentata ssp. wyomingensis* | 7–42 | – |
| | rubber rabbitbrush | ERNAN5 | *Ericameria nauseosa ssp. nauseosa var. nauseosa* | 7–42 | – |
| | creeping juniper | JUHO2 | *Juniperus horizontalis* | 7–42 | – |
| | Rocky Mountain juniper | JUSC2 | *Juniperus scopulorum* | 7–42 | – |
| | skunkbush sumac | RHTR | *Rhus trilobata* | 7–42 | – |
| | prairie rose | ROAR3 | *Rosa arkansana* | 7–42 | – |
| | soapweed yucca | YUGL | *Yucca glauca* | 7–42 | – |
| 7 | **Native shrubs** | | | 1–3 | |
| | broom snakeweed | GUSA2 | *Gutierrezia sarothrae* | 1–3 | – |
| | plains pricklypear | OPPO | *Opuntia polyacantha* | 1–3 | – |

## 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. Forage production is limited by steep slopes and very shallow soils, and the potential for runoff, which reduces the effectiveness of the precipitation received for plant growth. The steeper slopes may also limit livestock travel and result in poor grazing distribution, especially in areas away from water. 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 Communities 2 (medium and short grasses) occurs, 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 towards the potential community.

Plant Communities 3 or 4 have significantly reduced forage production (75–400 lbs./acre). 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. Often, when this site is in this condition, there is a significant amount of erosion pavement/bare ground present.

Communities 3 and 4 have lost many of the attributes of a healthy rangeland, including good infiltration, minimal erosion and runoff, nutrient cycling and energy use. Additional growing season rest is often necessary for re-establishment of the desired species and to restore the stability and health of the site.

Mechanical treatment to improve site health is not feasible due to the very shallow soils and steep slopes.

Wildlife Interpretations:

The Very Shallow ecological site, with its complex topography and vegetative structure, along with a tendency to occur in a mosaic with other ecological sites, often provides for a variety of habitat niches and cover types in an otherwise fairly uniform landscape. The general area provides thermal and escape cover for big game animals as well as a variety of other wildlife species. Shrub availability on steep, south slopes often provides important winter range for mule deer and elk. Abundant prey and perch sites (on rock outcrops and scattered trees) attract a variety of raptors. Sites having steeper, rocky topography provide habitat for interesting songbird species such as rock wrens, canyon wrens and spotted towhees. Scattered junipers and pines host field sparrows and chipping sparrows. Mountain plovers and night hawks often nest on the pebbly, relatively bare ground surface.

Plant Community 1: Tall and Medium Grasses/ Forbs/ Shrubs (HCPC):

The diversity of forbs, half-shrubs and shrubs provides feeding substrate for a variety of pollinating insects, which are prey for many birds, reptiles and small mammals. Springs and seeps are habitat for amphibians such as tiger salamanders. The short-horned lizard is a representative reptile. The diversity of plant species and life forms, in combination with topographic variation, provides high quality bird habitat. Lark sparrows, green-tailed towhees, mountain bluebirds and golden eagles are examples of birds using this community. Sharp-tailed grouse and sage grouse may use this community for lek sites on ridge tops and fairly level topography. The diversity of forbs and shrubs favors browsers and selective feeders such as mule deer and pronghorn. Large animal nutrition levels are relatively high yearlong because of plant species and life form diversity. Winter range value is often high for big game species when topographic diversity provides south exposures and browse plants such as skunkbush, rubber rabbitbrush and Wyoming big sagebrush are available. Small mammal diversity may be fairly high, reflecting the diversity of plants species and topography. Example species include the kangaroo rat, deer mouse, olive-backed pocket mouse and desert cottontail.

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

Insect diversity may decline with a partial loss of forb variety. The reduction of taller grasses and some desirable shrubs degrades habitat value for many birds, small mammals and big game. Potential increases in half-shrubs and shrubs may maintain big game winter range feeding value, although thermal cover may be reduced if the larger shrubs, such as skunkbush sumac decline. Small mammal diversity declines with the loss of vegetative diversity and litter cover.

Plant Community 3: Shrubs and Half-shrubs/ Sedges/ Short Grasses:

Insects may be abundant at the height of population cycles but species diversity is reduced significantly. Spring and

seep habitat is very degraded which results in poor amphibian habitat. Sparse vegetation and increased bare ground may provide suitable habitat for a few species (i.e. night hawks) but the lack of complex vegetative structure and residual cover makes this community poor habitat in general for most ground-nesting birds and relatively poor big game habitat. Pronghorn and mule deer may forage in this type throughout the year. However, nutritional levels for big game are greatly reduced and are available for a much shorter period as compared to the HCPC.

Plant Community 4: Shrubs and Half-shrubs/ Annual grasses and Forbs/ Short Grasses:

General wildlife habitat value is very poor in this community. Insect diversity and abundance is considerably reduced which decreases feeding opportunity for amphibians, birds and some small mammals. The lack of complex vegetative structural diversity, a shortened period of active plant growth and loss of ground cover make the habitat inhospitable for many birds and most small mammals. Big sagebrush, Rocky Mountain and creeping juniper, and fringed sagewort provide some valuable big game winter forage. Thermal cover values are very limited with the loss of skunkbush sumac and other shrubs as well as herbaceous cover. Small mammal diversity is very low. The seed-eating deer mouse may be fairly well represented.

## Hydrological functions

The soils associated with this ecological site are generally in Hydrologic Soil Group A. The infiltration rates for these soils are highly variable, requiring an on-site evaluation. The runoff potential for this site is low to moderate, depending on slope and ground cover/health. Runoff curve numbers generally range from 54 to 73

## 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): 5

BLM-Soil & Vegetation Inventory Method (SVIM) Data: 3

NRCS-Range Condition Record (ECS-2): 10

NRCS-Range/Soil Correlation Observations & Soil 232 notes: 30

Ecological Site Reference: NRCS 417 No.: Golden Valley County 518

## Contributors

MJR, REL, RSN, POH
RSN

## Approval

Kirt Walstad, 6/14/2023

## 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) | Loretta Metz |
| Contact for lead author | |
| Date | 04/23/2005 |
| Approved by | Kirt Walstad |
| Approval date | |
| Composition (Indicators 10 and 12) based on | Annual Production |

## Indicators

1. **Number and extent of rills:** Rills are present on slopes >35%. They are generally < 1.5 inches deep, < 3.0 inches wide, and < 10.0 feet long.

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2. **Presence of water flow patterns:** Will generally be rare on this site, but with the steeper slopes (>35%), and 25-50% bare ground, there may be areas which show accumulations of litter due to water movement and soil displacement by water, especially after severe storms.

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3. **Number and height of erosional pedestals or terracettes:** Wind and water erosion occurs, and there may be some plants with pedestals up to 0.5 inches in height. Terracettes are generally not present.

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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 between 25-50%.

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5. **Number of gullies and erosion associated with gullies:** Gully erosion is possible, but has not been quantified for this

site.

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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):** Litter movement will be minimal on the gradual slopes, however on the steeper slopes (>35%) there will be evidence of litter movement (i.e. debris dams) which may travel greater than 10 feet.

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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):** Stability values of 2-3 in plant interspaces. Stability values of 3-4 under plant canopies and at plant bases.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Organic matter in the A-horizon is between 0.5–1.5%. A-horizon is 1-2 inches thick. Surface structure should be moderate or strong granular.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Bunchgrasses and shrubs dominate this site. Perennial herbaceous plants are spaced 1-4 feet apart. Shrub species are spaced 3-14 feet apart.

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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):** None.

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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: mid-height, native perennial bunchgrasses >> native shrubs > warm season, short-height perennial grasses and grasslikes > native perennial and annual forbs.

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Plant mortality is low; decadence is minimal except in prolonged periods of drought.

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

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 700 – 850 #/acre.

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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:** Wyoming big sagebrush, Rocky Mountain juniper, threadleaf sedge, blue grama, broom snakeweed, thistles, fringed sagewort, plains pricklypear, cheatgrass, Japanese brome, red threeawn.

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

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