

Ecological Site Description—Rangeland

Shallow, 10–14" MAP

MLRA: 58A – Sedimentary Plains, East
 MLRA: 60B – Pierre Shale Plains, East
 R058AE019MT, R060BE576MT

Site Name: Shallow (Sw), 10–14 inches Mean Annual Precipitation (MAP)

Site Number: R058AE019MT, R060BE576MT

Major Land Resource Areas: 58A – Northern Rolling High Plains, North Part
 60B – Pierre Shale Plains, North Part

Rangeland Resource Units: 58AE – Sedimentary Plains, East
 60B – Pierre Shale Plains, East

1. Physiographic Features: This ecological site occurs on nearly level to very steep sedimentary plains, hills, and bedrock escarpments, and often occurs in complex with other ecological sites. This site occurs on all slopes and exposures. Aspect may be significant, especially on steep and very steep slopes. Variations in plant community composition and production can result due to aspect. Runoff and potential for water erosion are important features of this site. The amount of exposed rock outcrop tends to increase as slopes increase.

Elevation (feet): 1,900–3,500

Landform: shoulders and side slopes of hills, ridgetops, escarpments

Slope (percent): 0–60

Depth to Water Table (inches): greater than 60

Flooding: none

Ponding: none

Runoff Class: low to medium

Aspect: all aspects, can be significant

2. 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. See Climatic Data Sheet MLRA 58A, east and 60B, for more details (Section II of the NRCS Field Office Technical Guide). For local climate station information, refer to <http://www.wcc.nrcs.usda.gov>.

Frost-free period (32° F)-days: 105–145

Freeze-free period (28° F)-days: 125–170

Mean annual precipitation (inches): 10–14

3. Influencing Water Features: None

4. Associated sites: Mainly Sandy, Sandy-Steep, Silty, Silty-Steep, and Very Shallow. Rock outcrop is also a common feature associated with this site.

5. Similar sites: Sandy, Silty, Silty-Steep, Shallow clay, Very Shallow.

The Sandy and Silty sites vary by being over 20 inches deep and on slopes less than 15%.

The Silty-Steep site has soils greater than 20 inches deep and occurs on slopes greater than 15%.

The Shallow Clay site varies by texture.

The Very Shallow site is less than 10 inches deep, or has a water holding capacity of 2 inches or less.

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6. Soils: These soils are 10 to 20 inches deep to hard rock or soft beds of weathered siltstone or sandstone. Few roots penetrate deeper than 20 inches. Surface textures are mainly silt loam, loam, sandy loam, fine sandy loam, loamy fine sand, and very fine sandy loam.

Parent material (kind): alluvium, colluvium or residuum

Parent material (origin): semiconsolidated loamy or sandy sedimentary beds

Surface textures: silt loam, loam, sandy loam, fine sandy loams, very fine sandy loams, and loamy fine sand

Surface texture modifiers: gravelly

Subsurface Fragments <=3" (% volume): 0–35

Depth (inches): 10–20

Soil surface permeability (inches per hour): moderate (0.6–2.0) to moderately rapid (2.0–6.0)

Available Water Holding Capacity to 20" (inches): 2–4

Drainage Class: well to somewhat excessively

Salinity/Electrical Conductivity (mmhos/cm): non-saline (0–2)

Sodium Absorption Ratio (SAR): negligible

Reaction (pH) (1:1 water): neutral to moderately alkaline (6.6–8.4)

6a. Representative Soils: Listed below are soils and map units which characterize this site in various counties. (Reference MT-165, Soil Interpretive Rating Report).

COUNTIES	TYPICAL SOILS	MAP UNIT
Big Horn	Travessilla loam	LD, TE, TR, TS, THk
Carter	Cabbart silt loam	60D
Carter	Blacksheep fine sandy loam	55D, 55E, 155E
Custer	Cabbart silt loam / loam	605D / 18E
Custer	Blacksheep fine sandy loam	651C, 612F
Fallon	Cabbart silt loam	60D, 360D
Fallon	Blacksheep fine sandy loam	55E, 155E
Garfield	Cabbart silt loam	35E, 36E, 353D
Garfield	Blacksheep fine sandy loam	311D, 317C
McCone	Cabbart silt loam	31, 35
McCone	Fleak loamy sand / loamy fine sand	23, 72 / 20
Musselshell	Cabbart loam	81D, 86E
Musselshell	Blacksheep sandy loam	132B, 80E
Powder River	Elso silt loam	Ec, EI
Powder River	Ocean Lake fine sandy loam	Oc
Prairie	Cabbart loam	20, 44
Prairie	Blackhall fine sandy loam	8, 15
Rosebud	Cabbart loam	59, 207
Rosebud	Blackhall fine sandy loam	48, 49
Treasure	Bainville loam	Mm

7. Plant Community and Species Composition: The physical aspect of this site in Historical Climax is that of a mixed grassland/shrubland dominated by cool and warm season grasses and a mixture of shrubs. Approximately 60–70% of the annual production is from grasses and sedges, 5–10% from forbs, and 10–20% is from shrubs and half-shrubs. Canopy cover of shrubs is typically 5 to 15%. Ponderosa pine may occur on this site.

TABLE 7a.—Major Plant Species Composition, lists plant species composition and production by dry weight for the Historic Climax (HCPC) or Potential Plant Community (PPC) for this site. The Historic Climax or Potential Plant community has been determined by the study of rangeland relict areas, exclosures, or areas protected from excessive grazing. Total annual production has been derived from several data sources, and has been adjusted to represent a typical annual moisture cycle for the site. Reference for plant species names and symbols: USDA–NRCS PLANTS Database at <http://plants.usda.gov>.

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7a. Major Plant Species Composition – Historic Climax/Potential Plant Community

Common Name	Plant Symbol	Plant Group	Percent Comp.	Group Max. %	Mean Annual Precipitation (MAP) (inches)				
					10	11	12	13	14
					(lbs./acre)	(lbs./acre)	(lbs./acre)	(lbs./acre)	(lbs./acre)
Grasses and Sedges 60–70%					350	490	630	770	910
Bluebunch wheatgrass *	PSSP6	2	20-50		100-250	140-350	180-450	220-550	260-650
Prairie sandreed	CALO	5	10-20		50-100	70-140	90-180	110-220	130-260
Little bluestem	ANSC10	1	10-30		50-150	70-210	90-270	110-330	130-390
Plains muhly	MUCU3	3	5-15		25-75	35-105	45-135	55-165	65-195
Western wheatgrass	PASM	14	5-15		25-75	35-105	45-135	55-165	65-195
Sideoats grama	BOCU	3	5-10		25-50	35-70	45-90	55-110	65-130
Needleandthread	HECOC8	10	5-10		25-50	35-70	45-90	55-110	65-130
Threadleaf sedge	CAFI	12	1-5}	10	5-50 No more than 25 for any one	7-70 No more than 35 for any one	9-90 No more than 45 for any one	11-110 No more than 55 for any one	13-130 No more than 65 for any one
Sand dropseed	SPCR	9	1-5}						
Prairie junegrass	KOMA	12	1-5}						
Sandberg bluegrass	POSE	12	1-5}						
Blue grama	BOGR2	15	1-5}						
Plains reedgrass	CAMO	16	1-5}						
Green needlegrass	NAVI4	2	1-5}						
Buffalograss	BUDA	15	1-5}						
Indian ricegrass	ACH4	2	1-5}						
Bottlebrush squirreltail	ELEL5	10	0-5}						
Other native grasses	2GP		1-5}						
Red/ Fendler's threeawn	ARPUL	11	0-T						
Forbs 5–10 %					50	70	90	110	130
Black samson	ECAN2	21	1-5}	10	5-50 No more than 25 for any one	7-70 No more than 35 for any one	9-90 No more than 45 for any one	11-110 No more than 55 for any one	13-130 No more than 65 for any one
Scurfpea spp.	PSORA2	23	1-5}						
Purple prairieclover	DAPU5	21	1-5}						
White prairieclover	DACA7	21	1-5}						
Hairy goldenaster	CHV110	23	1-5}						
Prairie coneflower	RACO3	23	1-5}						
Dotted gayfeather	LIPU	21	1-5}						
American vetch	VIAM	18	1-5}						
Milkvetch spp.	ASTRA	24	1-5}						
Hoods phlox	PHHO	28	1-5}						
Buckwheat spp.	ERIOG	23	1-5}						
Green sagewort	ARDR4	19	1-5}						
Tufted milkvetch	ASSP6	24	1-5}						
Barr's matted pea	ASBA	24	0-5}						
Primrose spp.	OENOT	24	0-5}						
Penstemon spp.	PENST	24	0-5}						
Western yarrow	ACMI2	23	0-5}						
Miners candle	CRBR	24	0-5}						
Pussytoes spp.	ANTEN	20	0-5}						
Other native forbs	2FP		1-5}						
Shrubs and Half-shrubs 10–20 %					100	140	180	220	260
Skunkbush sumac	RHTR	33	5-10	20	5-100 No more than 25 for any one	7-140 No more than 35 for any one	9-180 No more than 45 for any one	11-220 No more than 55 for any one	13-260 No more than 65 for any one
Winterfat	KRLA2	35	1-5						
Yucca	YUGL	37	0-5						
Fringed sagewort	ARFR4	38	1-5}						
Prairie rose	ROAR	38	1-5}						
Green Rabbitbrush	CHVI8	36	0-5}						
Rubber Rabbitbrush	ERNAN5	36	0-5}						
Wyoming big sagebrush	ARTRW8	37	0-5}						
Rocky Mtn. juniper	JUSC2	37	0-5}						
Creeping juniper	JUHO2	38	0-5}						
Other native shrubs	2SB		0-5}						
Broom snakeweed	GUSA2	37	0-T						
Plains pricklypear	OPPO	38	0-T						
Total Annual Production (lbs./acre)			100%		500	700	900	1100	1300

* The percentage of this species tends to increase in the western part of this range resource unit.

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7b. Plant Group Descriptions: Plant functional groups are based on: season of growth, growth form, stature, type of root system, and ecological response to disturbance. Refer to Field Office Technical Guide (FOTG) Section II for a complete description of plant groups.

8. Total Annual Production: Total annual production is a measurement of the total aboveground production (dry weight) of all major plant species that occur on the site during a single growth year, regardless of accessibility to grazing animals. This information is listed at the bottom of TABLE 7a.—Major Plant Species Composition. Average production values are listed for each incremental inch of precipitation for the site.

9. Cover and structure: The following table shows the approximate amounts of basal cover, canopy cover, and plant heights for this site in the Historic Climax or Potential Plant Community.

COVER TYPE	BASAL COVER (%)	CANOPY COVER (%)	AVERAGE HEIGHT (inches)
Cryptogams	T – 1	0 – T	0.25
Grasses/ sedges	5 – 10	20 – 30	24
Forbs	1 – 4	1 – 5	18
Shrubs	1 – 5	10 – 15	24
Litter	15 – 25		
Coarse fragments	0 – 5		
Bare ground	30 – 50		

10. 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) or Potential Plant Community. 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 only moderate 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 the site can more readily return to the Historic Climax Plant Community (HCPC).

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 **bluebunch wheatgrass, prairie sandreed, little bluestem, plains muhly, sideoats grama, black samson, purple and white prairieclover, dotted gayfeather, winterfat, and skunkbush sumac**. These plants will be replaced by **needleandthread, sand dropseed, threadleaf sedge, blue grama, increaser forbs, yucca, rose, creeping juniper, and Wyoming big sagebrush**. Continued deterioration results in increased amounts of **red threeawn, fringed and green sagewort and plains pricklypear**.

Plants that are not a part of the climax community that are most likely to invade are **cheatgrass and Japanese bromes, six-weeks fescue, false buffalograss, broom snakeweed, and thistles**.

10a. Major Plant Community Types: Following are descriptions of several plant communities that may occupy this site.

Plant Community 1A, 1B, 1C: Tall and Medium Grasses/ Forbs/ Shrubs: These are the interpretive plant communities and are considered to be the Historic Climax Plant Community (HCPC) or Potential Plant Community (PPC) for this site. The variations between 1A, 1B, and 1C result from slight differences in soils and aspect, which alter the amount of effective moisture that plants receive for growth.

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These plant communities contain a high diversity of tall grasses (**prairie sandreed, little bluestem, big bluestem, needleandthread, Indian ricegrass, and bluebunch wheatgrass**), short grasses and sedges (**sand dropseed, plains muhly, prairie junegrass, threadleaf sedge and blue grama**), and shrubs (**skunkbush sumac and winterfat**). There are also abundant forbs, and half-shrubs which occur in small percentages.

1A. Warm Season Dominated: This plant community occurs primarily on cooler eastern and north aspects, or on flat slopes that receive additional moisture. The dominant grasses are **little bluestem, plains muhly, sideoats grama, western wheatgrass**, and short grasses such as **threadleaf sedge, prairie junegrass, and Sandberg bluegrass**. **Creeping juniper** is often common on this aspect.

1B. Coarse Textured Soils: This plant community occurs on more coarse textured sandy soils, and the dominant grasses are **prairie sandreed, little bluestem, sideoats grama, needleandthread**, and short grasses such as **threadleaf sedge, prairie junegrass, and Sandberg bluegrass**. **Yucca** is often common on this aspect.

1C. Cool Season Dominated: This plant community occurs primarily on warmer south and west aspects. Due to the droughty nature of this aspect, **bluebunch wheatgrass** tends to be more dominant. It will grow in association with **plains muhly, needleandthread, and western or thickspike wheatgrass**. This aspect is likely to have **skunkbush sumac and yucca** present.

These plant communities are 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.

Plant Community 2: Medium and Short Grasses/ Medium Shrubs and Half-shrubs: Slight disturbances and degradation to the HCPC will result in a plant community dominated by **needleandthread, western wheatgrass, threadleaf sedge, fringed and green sagewort, hairy goldenaster, prairie rose, and Wyoming big sagebrush**. The tall, more palatable grasses (little bluestem, bluebunch wheatgrass) will be present in smaller percentages. **Creeping juniper and yucca** may also increase.

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.

Plant Community 3: Short Grasses/ Shrubs and Half-shrubs: With continued heavy disturbance the site will become dominated by short grasses, such as **blue grama, prairie junegrass and threadleaf sedge**. **Needleandthread** will still be present in low amounts. Palatable shrubs and forbs will be mostly absent. Much of the production is from **green and fringed sagewort and broom snakeweed**. **Annual grasses and forbs** begin to invade the site.

This plant community is less productive than Plant Community 1 or 2 (< 750 pounds per acre). The lack of litter and short plant heights result in higher soil temperatures, poor water infiltration rates, and high evapotranspiration, which gives blue grama a competitive advantage over the cool season tall and medium grasses. This community has lost many of the attributes of a healthy rangeland, including good infiltration, minimal erosion and runoff, nutrient cycling and energy flow.

There are limitations to using mechanical treatment on this site due to the shallow soils.

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Plant Community 4: Half-shrubs/ Short Grasses and Sedges/ Cacti/ Annuals: With continual heavy disturbance over several years, this site will experience a loss of topsoil and an increase of bare ground. The community will change to one dominated primarily by **fringed sagewort, broom snakeweed, red threawn, short grasses, and annual grasses and forbs**. **Plains prickly pear** expands onto the site.

This community has extremely reduced productivity of perennial grasses (< 300 pounds per acre). Significant economic inputs and time would be required to move this plant community toward a higher successional stage and a more productive plant community.

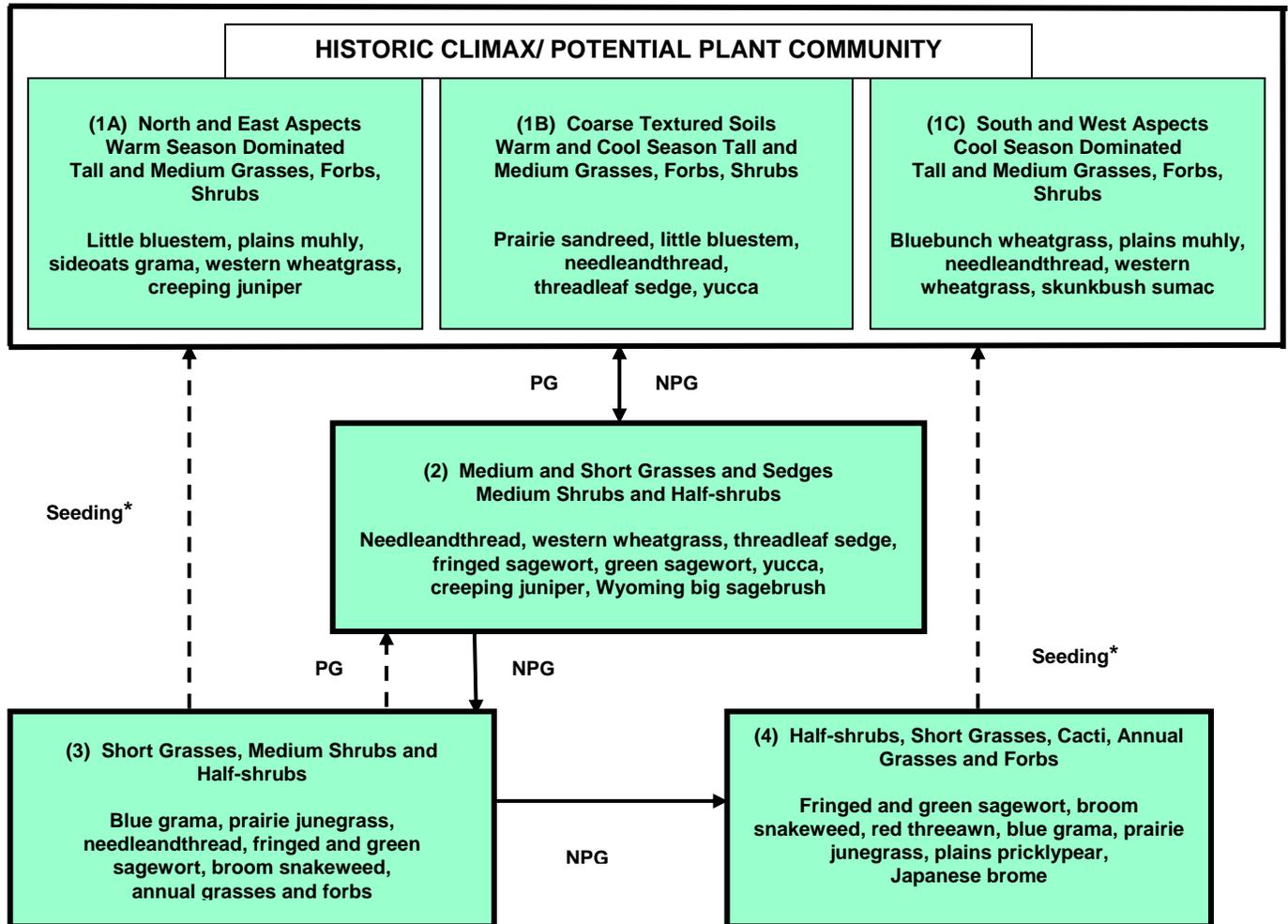
10b. Plant Communities and Transitional Pathways (State and Transition Model): Transitions in plant community composition occur along a gradient that is not linear. Many processes are involved in the changes from one community to another. Changes in climate, elevation, soils, landform, fire patterns and frequency, and grazing all play a role in determining which of the plant communities will be expressed. The following model outlines the various plant communities that may occur on this site and provides a diagram of the relationship between plant community and type of use or disturbance.

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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 improve or change the plant community. Dashed lines returning to a state (within the heavy lines) indicates a reduced probability of success, and will usually require major economic inputs, or a more intensive grazing strategy.

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.

* See comments in narrative under livestock grazing.

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.

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11. Plant Growth Curves: Growth of native cool-season plants begins in April and continues to the end of June. Native warm-season plants begin growth about mid May and continue to about the end of August. Green up of cool-season plants can occur in September through October when adequate soil moisture is present. The following tables show the approximate percentage of total growth by month that is expected to occur in various plant communities on this site for a "typical" moisture year.

Growth Curve Number: MT0811

Growth Curve Description: Includes all eastern sedimentary plains sites in the 10 – 14" p.z. with droughty upland soils, having mainly cool season plants.

Totals for Each Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	5	25	35	30	5	0	0	0	0	0

Cumulative Totals by Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	5	30	65	95	100	0	0	0	0	0

Growth Curve Number: MT0812

Growth Curve Description: Includes all eastern sedimentary plains sites in the 10 – 14" p.z. with droughty upland soils, having mainly warm season plants.

Totals for Each Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	5	15	25	35	15	5	0	0	0	0

Cumulative Totals by Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	5	20	45	80	95	100	0	0	0	0

Growth Curve Number: MT0813

Growth Curve Description: Includes all low condition sites in eastern sedimentary plains sites, dominated by short grasses.

Totals for Each Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	0	25	25	25	10	10	5	0	0	0

Cumulative Totals by Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	0	25	50	75	85	95	100	0	0	0

12. 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 somewhat limited by steep slopes and 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 Community 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 to one more similar to potential if a good seed source of the taller grasses still exists.

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Plant Communities 3 and 4 have significantly reduced forage production (200-600 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. Additional growing season rest is often necessary for re-establishment of the desired species and to restore the stability and health of the site.

Some practices such as seeding and mechanical treatment are typically not recommended on shallow soils, such as those associated with this ecological site. However, in this MLRA/MLRU, this ecological site is often a minor component of larger map units containing deeper soils. In these situations, treating the shallow site is often only incidental to treating the larger area of deeper soils. Also, to avoid the shallow component of these areas often becomes impractical. In some locations, shallow soils have been cultivated as part of a field composed of mainly deeper soils. Reseeding is generally feasible and practical in these situations.

12a. Calculating Safe Stocking Rates: Proper stocking rates should be incorporated into a grazing management strategy that protects the resource, maintains or improves rangeland health, and is consistent with management objectives. Safe stocking rates will be based on useable forage production, and should consider ecological condition and trend of the site, and past grazing use history.

Calculations used to determine an safe stocking rate are based on the amount of useable forage available, taking into account the harvest efficiency of the animal and the grazing strategy to be implemented. Average annual production must be measured or estimated to properly assess useable forage production and stocking rates.

12b. Guide to Safe Stocking Rates: The following charts provide a guide for determining an safe stocking rate. Animal Unit Month (AUM) figures are based on averages of forage production from data collected for this site over several years. The characteristic plant communities and production values listed may not accurately reflect the productivity of a specific piece of land, hence this table should not be used without on-site information as to current forage productivity of the site. Adjustments to stocking rates for each range unit must be made based on topography, slope, distance to livestock water, and other factors, which effect livestock grazing behavior.

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12c. Stocking Rate Guide:

Major Plant Community Dominant Plant Species	MAP	Total Production (pounds/ac)	Cattle			Sheep		
			Forage Production	AUM/ac	Ac/AUM	Forage Production	AUM/ac	Ac/AUM
1A, 1B, 1C. Tall and Medium Grasses, Forbs, Shrubs (HCPC/PPC) <i>Prairie sandreed, little bluestem, bluebunch wheatgrass, western wheatgrass, needleandthread, skunkbush sumac</i> (S.I. >70%)	13–14"	1100 – 1300	950 – 1100	.30 – .35	2.9 – 3.3	1000 – 1200	.32 – .38	2.6 – 3.1
	10–12"	500 – 900	400 – 750	.13 – .24	4.2 – 7.7	450 – 800	.14 – .25	4.0 – 7.1
2. Medium and Short Grasses, Medium Shrubs & Half-shrubs <i>Needleandthread, western wheatgrass, threadleaf sedge, fringed and green sagewort, Wyoming big sagebrush, creeping juniper, yucca</i> (S.I. 50–70%)	13–14"	950 – 1100	600 – 900	.19 – .28	3.6 – 5.3	750 – 1000	.24 – .32	3.1 – 4.2
	10–12"	400 – 750	250 – 600	.08 – .19	5.3 – 12.5	300 – 675	.09 – .21	4.8 – 11.1
3. Short Grasses, Medium Shrubs and Half-shrubs <i>Blue grama, threadleaf sedge, prairie junegrass, fringed and green sagewort, broom snakeweed, cheatgrass</i> (S.I. 30–50%)	10–14"	350 – 900	175 – 600	.05 – .19	5.3 – 20.0	250 – 700	.08 – .22	4.5 – 12.5
4. Half-shrubs, Short Grasses, Cacti, Annuals <i>Fringed and green sagewort, broom snakeweed, red threeawn, blue grama, plains pricklypear, Japanese brome</i> (S.I. < 10%)	10–14"	250 – 650	150 – 350	.03 – .07	14 – 33.3	175 – 450	.04 – .10	10 – 25

Stocking rates are calculated from average forage production values using a 25% Harvest Efficiency factor for preferred & desirable plants, and 10% Harvest Efficiency for less desirable species. AUM calculations are based on 790 pounds per animal unit month (AUM) for a 1,000-pound cow with calf up to 4 months. No adjustments have been made for site grazability factors, such as steep slopes, site inaccessibility, or distance to drinking water.

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12d. Plant Forage Preferences for Cattle and Sheep

Legend: P=Preferred D=Desirable U=Undesirable E=Emergency
N=Nonconsumed T=Toxic Blank=Unknown or no data

Winter (W) = Jan., Feb., March; Spring (SP) = April, May, June;
Summer (SU) = July, Aug., Sept.; Fall (F) = Oct., Nov., Dec.

PLANT NAME	Cattle				Sheep			
	W	SP	SU	F	W	SP	SU	F
Green needlegrass	P	P	P	P	P	P	P	P
Western wheatgrass	P	D	D	P	D	D	D	D
Thickspike wheatgrass	P	P	P	P	P	P	P	P
Little bluestem	P	P	P	P	U	D	D	U
Bluebunch wheatgrass	P	D	P	P	D	D	D	D
Sidecoats grama	P	P	P	P	D	D	P	D
Needleandthread ^{1/}	D	D	D	D,T	D	D	D	D
Sandberg bluegrass	D	D	D	D	D	D	D	D
Threadleaf and Needleleaf sedge	D	P	P	D	D	P	P	D
Prairie junegrass	D	D	D	D	D	P	D	D
Plains muhly	D	D	D	D	D	D	D	D
Blue grama	D	D	D	D	D	P	P	D
Plains reedgrass	D	D	D	D	U	U	U	U
Buffalograss	D	D	D	D	D	D	D	D
Red threeawn	N	U	N	N	N	U	N	N
Tumblegrass	N	U	N	N	N	U	N	N
Cheatgrass ^{2/}	U	D	N	N	U	P	U	U
Black samson	N	D	D	D	D	P	P	D
Prairieclover spp.	N	D	D	D	D	D	D	D
Dotted gayfeather	N	P	P	P	D	P	D	D
Milkvetch spp. ^{3/}	N	D,T	D,T	D,T	D,T	P,T	D,T	D,T
American vetch	N	P	P	D	N	P	P	D
Prairie coneflower	N	D	D	D	D	D	D	D
Wild onion	N	P	P	N	N	P	P	N
Hood's phlox	N	N	N	N	U	U	U	U
Pussytoes spp.	N	N	N	N	U	U	U	U
Wild parsley	N	D	D	U	N	D	D	U
Green sagewort	N	N	N	N	N	N	N	N
Scarlet globemallow	N	D	D	D	N	D	D	D
Two-grooved poisonvetch	N	T	T	T	N	T	T	T
White point loco	N	T	T	T	T,N	T,N	T,N	T,N
Low larkspur	N	N,T	N,T	N	N	D,T	D,T	N
Death camas	N	T	T	N	N	T	T	N
Winterfat	P	P	P	P	P	D	D	P
Prairie rose	N	N	N	N	D	D	D	D
Silver sagebrush	D	D	D	D	D	D	D	D
Green and Rubber rabbitbrush	U	U	U	U	U	U	U	U
Skunkbush sumac	N	N	N	N	N	N	N	N
Wyoming big sagebrush	N	N	N	N	P	D	D	P
Rocky Mountain juniper	N	N	N	N	U	N	N	N
Creeping juniper	N	N	N	N	U	N	N	N
Fringed sagewort	N	N	N	N	U	U	U	U
Yucca	N	N	N	N	D	D	D	D
Broom snakeweed ^{4/}	N	N	N	U	U	U	U	U
Plains pricklypear ^{5/}	N	N	N	N	U	U	U	U

^{1/} The awns and sharp seeds of needleandthread can harm livestock when dry.

^{2/} Not a native plant, but a common invader.

^{3/} Some species of milkvetch are poisonous.

^{4/} Broom snakeweed can be poisonous, but this is not usually a problem in Montana because plants die back in winter and do not have green leaves in early spring.

^{5/} The spines can be injurious to livestock.

Ecological Site Description—Rangeland

Shallow, 10–14" MAP

MLRA: 58A – Sedimentary Plains, East
MLRA: 60B – Pierre Shale Plains, East
R058AE019MT, R060BE576MT

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

Plant Community 1: Tall Grasses/Forbs/Shrubs (HCPC or PPC): The complex topography and vegetative structure of this site, along with the tendency to occur in a mosaic with other ecological sites, results in diverse wildlife habitat. The abundance and diversity of forbs and shrubs favor browsers and selective feeders such as mule deer and pronghorn. Warm season grasses (1a. and 1b.) extend the availability of nutritious forage for grazers and mixed feeders including bison and elk. Large animal nutrition levels are relatively high yearlong because of the diversity of grasses, forbs and shrubs. The general area often provides thermal and escape cover for big game animals. Shrub availability on steep, south slopes, provides important winter range for mule deer and elk (1c.). The majority of small mammals found on this site are seed-eaters such as deer mice and kangaroo rats. 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 Rocky Mountain juniper and Ponderosa pine host field sparrows and chipping sparrows.

Plant Community 2: Medium and Short Grasses/ Medium Shrubs and Half-shrubs: The loss of warm season grasses shortens the green feed period for grazers and mixed feeders such as bison and elk. Loss of vegetative structural diversity reduces habitat value for big game, small mammals and birds. Pronghorn and deer habitat suffers from a loss of forb diversity. Potential increases in big sagebrush and rabbitbrush cover may provide sage grouse nesting and winter habitat and browse for deer and pronghorn. Sagebrush/grassland obligates such as Brewer's and sage sparrows may also benefit. However, the reduction in residual grass and litter cover reduces habitat value for ground-nesting birds.

Plant Community 3: Short Grasses/ Medium Shrubs and Half-shrubs: The period of high nutrition levels for grazers and mixed feeders is shortened considerably with the loss of grass and forb diversity. Small mammal populations are dominated by deer mice as annual plants increase. Breeding bird habitat value declines with loss of residual plant material and litter.

Plant Community 4: Half-shrubs/ Short Grasses/ Cacti/ Annual Grasses & Forbs: Sparse vegetation and greater coverage of bare ground may provide suitable habitat for mountain plovers, horned larks and McCown's longspurs. However, a lack of complex vegetation 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 community spring through fall.

Ecological Site Description—Rangeland

Shallow, 10–14" MAP

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R058AE019MT, R060BE576MT

13a. Plant Preferences for Antelope and Deer:

Legend: P=Preferred D=Desirable U=Undesirable E=Emergency
N=Nonconsumed T=Toxic Blank=Unknown or no data

Winter (W) = Jan., Feb., March; Spring (SP) = April, May, June;
Summer (SU) = July, Aug., Sept.; Fall (F) = Oct., Nov., Dec.

PLANT NAME	Antelope				Deer			
	W	SP	SU	F	W	SP	SU	F
Perennial grasses	P	P	P	P	D	P,D	D	D
Red threeawn	N	N	N	N	N	N	N	N
Annual grasses	N	P,D	N	D	N	P,D	N	D
Sedges	D	P	P	P	D	P	P	P
Black samson	P	P	P	P	D	D	D	D
Prairieclover spp.	P	P	P	P	P	P	P	P
Dotted gayfeather	D	P	D	D	D	P	P	P
Milkvetch spp.	D	P	P	D	D	D	D	D
Scurfpea spp.	N	D	D	D	D	D	D	D
Hairy goldenaster	E	E	E	E	E	E	E	E
Goldenrod spp.	D	P	P	P	D	D	D	D
American licorice	P	P	D	D	D	P	D	D
Prairie coneflower	D	P	P	D	D	P	D	D
American vetch	P	P	P	P	D	P	P	P
Hood's phlox	U	U	U	U	U	U	U	U
Wild parsley	U	D	U	U	U	D	U	U
Green sagewort	N	N	N	N	N	N	N	N
Scarlet globemallow	D	D	D	D	D	D	D	D
Twogrooved poinsonvetch	N, T	N, T	N, T	N, T	N, T	N, T	N, T	N, T
White point loco	N, T	N, T	N, T	N, T	N, T	N, T	N, T	N, T
Death camas	N, T	N, T	N, T	N, T	N, T	N, T	N, T	N, T
Larkspur spp.	N, T	N, T	N, T	N, T	N, T	N, T	N, T	N, T
Winterfat	P	P	P	P	P	P	P	P
Skunkbush sumac	P	P	D	D	E	E	E	E
Prairie rose	U	U	U	U	E	D	E	E
Silver sagebrush	D	D	P	D	P	P	D	P
Wyoming big sagebrush	P	P	P	P	P	P	D	D
Rabbitbrush spp.	D	D	D	D	D	D	D	D
Rocky Mountain juniper	N	N	N	N	D	D	D	D
Creeping juniper	N	N	N	N	D	D	D	D
Fringed sagewort	D	U	U	D	D	U	U	D
Green sagewort	N	N	N	N	N	N	N	N
Plains pricklypear	N	N	N	N	N	N	N	N
Yucca	N	N	N	N	N	N	N	N
Broom snakeweed	N	N	D	N	D	D	P	P

14. Hydrology Data: The runoff potential for this site is low to moderate, depending on slope and ground cover/health. Runoff curve numbers generally range from 78 to 90. The soils associated with this ecological site are generally in Hydrologic Soil Group C. The infiltration rates for these soils will normally be moderate to moderately rapid.

Ecological Site Description—Rangeland

Shallow, 10–14" MAP

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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 Communities 1a, 1b, 1c, and 2) 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 species such as blue grama, annual grasses, and shrubs.

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).

15. Recreation and Natural Beauty: 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.

16. Wood Products: None

17. Site Documentation:

Authors: Original: REL, AJN, 1983 Revised: JVF, REL, RSN, MJR, SKW, SVF, POH, 2003

Supporting Data for Site Development:

NRCS–Production & Composition Record for Native Grazing Lands (Range-417): 9
BLM–Soil & Vegetation Inventory Method (SVIM) Data: 6
NRCS–Range Condition Record (ECS-2): 62
NRCS–Range/Soil Correlation Observations & Soil 232 notes: 30

Field Offices where this site occurs within the state:

Baker	Ekalaka	Hysham	Sidney
Billings	Forsyth	Jordan	Terry
Broadus	Glendive	Miles City	Wibaux
Circle	Hardin	Roundup	

Site Approval: This site has been reviewed and approved for use:

Rhonda Sue Noggles
State Rangeland Management Specialist

06/30/03
Date

Ecological Site Description—Rangeland

Shallow, 10–14" MAP

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Shallow 10–14"
Sedimentary Plains, east
Plant Community 1
HCPC /PPC



Shallow 10–14"
Sedimentary Plains, east
Plant Community 1
HCPC /PPC



Shallow 10–14"
Sedimentary Plains, east
Plant Community 1
HCPC /PPC

Ecological Site Description—Rangeland

Shallow, 10–14" MAP

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Shallow 10–14"
Sedimentary Plains, east
Plant Community 2



Shallow 10–14"
Sedimentary Plains, east
Plant Community 2



Shallow 10–14"
Sedimentary Plains, east
Plant Community 3

Ecological Site Description—Rangeland

Shallow, 10–14" MAP

MLRA: 58A – Sedimentary Plains, East
MLRA: 60B – Pierre Shale Plains, East
R058AE019MT, R060BE576MT



**Shallow 10–14"
Sedimentary Plains, east
Plant Community 3
Threadleaf sedge**



**Shallow 10–14"
Sedimentary Plains, east
Plant Community 4**