

Ecological Site Description—Rangeland

Coarse Clay, 10–14" MAP

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

Site Name: Coarse Clay (CC), 10–14 inches Mean Annual Precipitation (MAP)

Site Number: R058AE192MT, R060BE567MT

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

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

1. 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.

Elevation (feet): 1,900–3,500

Landform: plains and hills

Slope (percent): 0–25, mainly less than 8

Flooding: none

Ponding: none

Runoff Class: medium to very high

Aspect: not 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 (MAP): 10–14 inches

3. Influencing Water Features: None

4. Associated sites: Clayey, Clayey-Steep, Shallow Clay, and Shale.

5. Similar sites: Shale, Sandy, Shallow Clay.

The Shale site differs by being very sparse, having low production, and having a much different plant community (western wheatgrass, Nuttall's saltbush).

The Sandy site often has a somewhat similar plant community, but is much more productive, plus it occurs on sandy soils instead of shales.

The Shallow Clay site differs by having a different plant community (western wheatgrass, green needlegrass).

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6. Soils: 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.

Parent material (kind): mainly residuum

Parent material (origin): acid shale

Surface textures: silty clay loam, silty clay, or clay

Depth (inches): 10–40

Soil surface permeability (inches per hour): moderate (0.6–2) for the surface, decreases as approach shale contact.

Available Water Holding Capacity to 40" (inches): less than 4

Drainage Class: well

Salinity/Electrical Conductivity (mmhos/cm): non to slightly saline (0–4)

Sodium Absorption Ratio (SAR): 0–13

Reaction (pH) (1:1 water): extremely acid to slightly acid (3.5–6.5) mainly because of sodium sulfate

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
Carter (60B)	Julin silty clay loam	298E, 634E
Carter (60B)	Volborg clay	98C, 258D, 298E, 398E, 634E
Garfield	Neldore clay	203F, 204F, 205D
McCone	Neldore clay	115, 116, 117
Musselshell	Volborg silty clay	61E
Rosebud (60B)	Volborg silty clay	191

7. Plant Community and Species Composition: The physical aspect of this site is that of sparse grassland or savannah dominated by warm-season grasses with scattered Ponderosa pine, Rocky Mountain juniper and/or bur oak (only in the southeast corner of Montana) in some locations. Approximately 75–80% of the annual production is from grasses and sedges, 1–5% from forbs, and 5–15% is from shrubs and half-shrubs. The canopy cover of shrubs is 5–10%.

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 75–80%					200	320	480	600	720
Prairie sandreed	CALO	5	30-50		75-125	120-200	180-300	225-375	270-450
Little bluestem	ANSC10	1	15-40		38-100	60-160	90-240	112-300	135-360
Sun sedge	CAHE5	3	10-15		25-38	40-60	60-90	75-112	90-135
Western wheatgrass	PASM	14	5-10		12-25	20-40	30-60	38-75	45-90
Threadleaf sedge	CAFI	12	1-5}	10	2-25 No more than 12 for any one	4-40 No more than 20 for any one	6-60 No more than 30 for any one	8-75 No more than 38 for any one	9-90 No more than 45 for any one
Prairie junegrass	KOMA	12	1-5}						
Sandberg bluegrass	POSE	12	1-5}						
Plains reedgrass	CAMO	16	1-5}						
Indian ricegrass	ACHY	2	1-5}						
Other native grasses	2GP		1-5}						
Forbs 1–5%					12	20	30	38	45
Prairie thermopsis	THRH	20	1-5}	5	2-12	4-20	6-30	8-38	9-45
Dotted gayfeather	LIPU	21	1-5}						
American vetch	VIAM	18	1-5}						
Wild onion	ALLIU	32	1-5}						
Comandra	COUM	18	1-5}						
Buckwheat spp.	ERIOG	23	1-5}						
Western yarrow	ACMI2	19	1-5}						
Green sagewort	ARDR4	19	1-5}						
Other native forbs	2FP		1-5}						
Shrubs and Half-shrubs 5–15%					38	60	90	112	135
Slenderbush eriogonum	ERMI4	37	1-10}	15	2-38 No more than 25 for any one	4-60 No more than 40 for any one	6-90 No more than 60 for any one	8-112 No more than 75 for any one	9-135 No more than 90 for any one
Longleaf sagebrush	ARLO7	37	1-10}						
Wyoming big sagebrush	ARTRW8	37	1-10}						
Rubber rabbitbrush	ERNAN5	36	1-10}						
Prairie rose	ROAR3	38	1-10}						
Skunkbush sumac	RHTR	33	1-10}						
Yucca	YUGL	37	1-10}						
Creeping juniper	JUHO2	38	1-10}						
Other native shrubs	2SB		1-10}						
Total Annual Production (lbs./acre)			100%		250	400	600	750	900

Trees: Bur oak (extreme SE Montana, only), Ponderosa pine, and Rocky Mountain juniper are often common.

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.

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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	0 – T	0 – T	0.25
Grasses/sedges	3 – 7	30 – 50	24
Forbs	1 – 2	1 – 5	18
Shrubs	T – 1	5 – 10	24
Trees	T – 1*	0 – 10	30 – 40 feet
Litter	15 – 25		
Coarse fragments	0 – 4		
Bare ground	60 – 80		

* Based on estimated basal area of 60 square feet per acre.

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 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**.

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

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) or Potential Plant Community (PPC) 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**.

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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.

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.

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.

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.

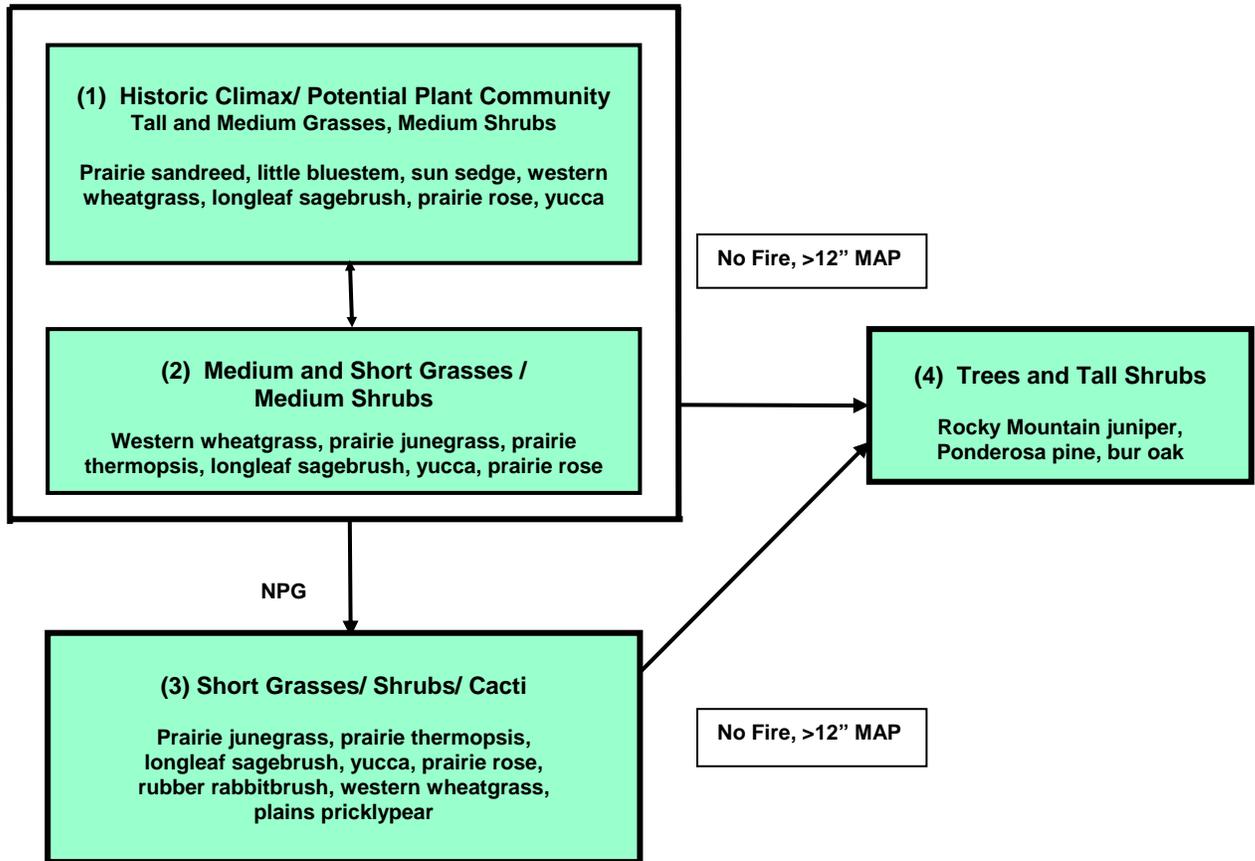
10b. Plant Communities and Transitional Pathways (State and Transition Model): Transitions in plant community composition occur along a gradient that is not linear. Many processes are involved in the changes from one community to another. Changes in climate, elevation, soils, landform, fire patterns 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 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.

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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: 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. 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.

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.

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Calculations used to determine a 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 initial 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.

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
1. Tall and Medium Grasses, Shrubs (HCPC/PPC) <i>Prairie sandreed, little bluestem, sun sedge, western wheatgrass, longleaf sagebrush, prairie rose, yucca</i> (S.I. >70%)	13–14"	750 – 900	650 – 750	.21 - .24	4.2 – 4.8	675 – 800	.21 - .25	4.0–4.8
	10–12"	250 -600	200 – 500	.06 - .16	6.2 – 16.7	225 – 500	.07 - .17	5.9–14.3
2. Medium and Short Grasses, Shrubs <i>Western wheatgrass, prairie junegrass, prairie thermopsis, longleaf sagebrush, yucca, prairie rose</i> (S.I. 50–70%)	13–14"	600 – 700	450 – 525	.14 - .17	5.9 – 7.1	475 – 550	.15 - .17	5.9–6.7
	10–12"	200 – 500	150 – 375	.05 - .12	8.3 –20.0	150 – 400	.05 - .13	7.7–20
3. Short Grasses, Shrubs, Cacti <i>Prairie junegrass, prairie thermopsis, longleaf sagebrush, yucca, prairie rose, rubber rabbitbrush, western wheatgrass, plains pricklypear</i> (S.I. 25 - 50 %)	10–14"	125 – 450	75 – 275	.02 - .06	16.7 – 50	100 – 300	.02 - .07	14.3–50
4. Trees and Tall Shrubs <i>Rocky Mountain juniper, Ponderosa pine, bur oak</i> (S.I. < 20%)	10–14"	100 - 400	50 - 100	< .01	>100	50 - 100	< .01	>100

Stocking rates are calculated from average forage production values using a 25% Harvest Efficiency factor for preferred and 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
Prairie sandreed	D	D	D	D	U	U	U	U
Little bluestem	P	P	P	P	U	D	D	U
Sun sedge	D	P	D	P	D	P	P	D
Western wheatgrass	P	D	D	P	D	D	D	D
Thickspike wheatgrass	P	P	P	P	P	P	P	P
Indian ricegrass	P	P	P	P	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 reedgrass	D	D	D	D	U	U	U	U
Other native grasses	D	D	D	D	D	D	D	D
Cheatgrass ^{1/}	U	D	N	N	U	P	U	U
Dotted gayfeather	N	P	P	P	D	P	D	D
American vetch	N	P	P	D	N	P	P	D
Wild onion	N	P	P	N	N	P	P	N
Green sagewort	N	N	N	N	N	N	N	N
Scarlet globemallow	N	D	D	D	N	D	D	D
Prairie thermopsis	N, T	N, T	N, T	N, T	N	U	U	N
Remaining forbs on list	N	N	N	N	N	U	N	N
Longleaf sagebrush	N	N	N	N	U	U	U	U
Slenderbush eriogonum	N	N	N	N	U	U	U	U
Prairie rose	N	N	N	N	D	D	D	D
Rubber rabbitbrush	U	U	U	U	U	U	U	U
Wyoming big sagebrush	N	N	N	N	P	D	D	P
Rocky Mtn. Juniper	N	N	N	N	U	N	N	N
Yucca	N	N	N	N	D	D	D	D
Skunkbush sumac	N	N	N	N	N	N	N	N
Creeping juniper	N	N	N	N	U	N	N	N
Plains pricklypear ^{2/}	N	N	N	N	U	U	U	U

^{1/} Not a native plant, but a common invader.

^{2/} The spines can be injurious to livestock.

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 and Medium Grasses/ Medium Shrubs (HCPC or PPC): 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.

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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.

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
Annual grasses	N	P,D	N	D	N	P,D	N	D
Sedges	D	P	P	P	D	P	P	P
Dotted gayfeather	D	P	D	D	D	P	P	P
Prairie thermopsis	N	U	U	N	N	U	U	N
Eriogonums	N	D	D	U	N	D	D	U
Remaining forbs	E,N	E,N	E,N	E,N	E,N	E,N	E,N	E,N
Green sagewort	N	N	N	N	N	N	N	N
Longleaf sagebrush	D	D	D	D	D	D	D	D
Slenderbush eriogonum	N	D	U	N	N	D	U	N
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 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.

Ecological Site Description—Rangeland

Coarse Clay, 10–14" MAP

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

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).

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: Poles and lumber from ponderosa pine and Rocky Mountain juniper.

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): 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

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

Coarse Clay, 10–14" MAP

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



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



Coarse Clay 10–14"
Sedimentary Plains, east
Plant Community 1
HCPC /PPC
McCone County



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

Ecological Site Description—Rangeland

Coarse Clay, 10–14" MAP

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



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



Coarse Clay 10–14"
Sedimentary Plains, east
Plant Community 2
Rosebud County



Coarse Clay 10–14"
Sedimentary Plains, east
Plant Community 3 to 4

Ecological Site Description—Rangeland

Coarse Clay, 10–14" MAP

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



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



**Coarse Clay 10–14"
Sedimentary Plains, east
Plant Community 4
Scattered ponderosa pine**