

# SECTION II

## Ecological Site Description—Rangeland

TECHNICAL GUIDE  
Clayey (Cy), 11–14" MAP

Site Name: Clayey (Cy), 11-14" MAP

Site Number(s): R058AC041MT

Major Land Resource Area (MLRA)/Range Resource Unit (RRU):  
58A-C, Sedimentary Plains, Central

Interstate Correlation: None needed.



### 1. Physiographic features:

**Landform:** sedimentary plain, fan, terrace, swale

**Elevation (feet):** 1,900–4,500

**Slope (percent):** 0–15, mainly less than 8

**Depth to Water Table (inches):** greater than 60

**Flooding:** none

**Ponding:** none

**Runoff Class:** medium to high

**Aspect:** not significant

**2. Climatic Features:** See Climatic Data Sheet for more details (Section II of the Field Office Technical Guide) or reference the following climatic web site: <http://www.wcc.nrcs.usda.gov/cgibin/state.pl?state=mt>.

**Frost-free period (32° F)-days:** 120 - 135

**Freeze-free period (28° F)-days:** 135 - 155

**Mean annual precipitation (inches):** 11 – 14

**3. Influencing water features:** None.

**4. Associated sites** (same MLRA and MAP zone): Clayey-Steep, Shallow Clay, Silty, and Clay Pan.

**5. Similar sites** (same MLRA and MAP zone): Clayey-Steep, Clay Pan, and Silty.

The Clayey-Steep differs mainly by being on slopes greater than 15% and having lower production.

The Clay Pan site differs mainly by having a thinner surface over a hard argillic horizon, being sodium affected, and having lower production.

The Silty site differs mainly by soil texture.

**6. Soils:** These soils are typically clay loam, silty clay loam, silty clay, sandy clay, and clays that are more than 20 inches deep. There are no significant limitations to plant growth. Available Water Holding Capacity to 40 inches is mostly about 5.5 to 6.0 inches.

**Parent material (kind):** alluvium

**Parent material (origin):** calcareous shale

**Surface textures:** Silty clay loam, clay loam, silty clay, sandy clay, clay

**Subsurface Fragments <=3" (% volume):** 2-12

**Subsurface Fragments > 3" (% volume):** 0-5

**Depth (inches):** greater than 20

**Soil Surface Permeability Class:** slow to very slow

**Available Water Holding Capacity to 40" (inches):** varies from 2.0 to 7.0, depending on restrictive layer.

**Drainage Class:** well drained

**Salinity/Electrical Conductivity (mmhos/cm):** 0-4.0

**Sodium Absorption Ratio (SAR):** 0-5.0

**Reaction (pH) (1:1 water):** 7.4-8.4

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**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	Some MAP UNITS
Blaine	Bascovy, Marvan	11, 88
Carbon	Haverson, Heldt, Hydro, Kyle, Midway, Nunn, Razor, Toluca, Thedalund, Thurlow, Toluca, Twin Creek	Hn, Hs, Hy, Kc, MR, Nn, Rb, TT, Te, Tk, To, Tz
Fergus	Abor, Ethridge, Julin, Kobar, Linnet, Marias, Marvan, Pendroy, Ritchey, Tanna, Teigen, Thebo, Verson,	1, 135, 140, 150, 160, 166, 182, 189, 222, 225, 233, 255, 87
Garfield	Harlake	621A
Golden Valley	Abor, Verson	74D, 58A
Musselshell	Abor, Ethridge, Verson	74D, 158A, 58A
Park	Ethridge, Megonot, Richey, Tanna	153D, 5415, 166C, 5401
Petroleum	Abor, Bascovy, Ethridge, Harlem, Harlake, Kobar, Marias, Tanna, Teigen, Verson, Yamac	1, 8, 33, 42, 45, 54, 57, 75, 87, 95
Phillips	Bascovy, Marvan	11, 88, 251C, 973C
Stillwater	Ethridge, Harlem, Kobar, Tanna	146C, 23, 30, 55, 129C
Sweet Grass	Bascovy, Ethridge, Greybear, Harlem, Kobase, Megonot, Richey, Tanna	23, 129C, 146B, 150C, 166B, 365C, 370D
Wheatland	Abor, Ethridge, Harlem, Marias, Marvan, Megonot, Kobar, Pinelli, Richey, Tanna, Zatoville	8B, 17A, 53A, 60B, 63A, 64B, 68C, 146B, 166C, 169C, 234C
Yellowstone	Arvada, Bew, Big Horn, Elso, Fort Collins, Grail, Haverson, Heldt, Hesper, Hydro, Keiser, Kyle, Lohmiller, Midway, Pierre, Razor, Thurlow, Vananda, Wanetta	Ay, Bm, Bs, Ec, Fl, Gr, Hc, Ho, Hw, Kh, Kl, Lo, Mw, Pc, Ra, Ta, Va, Wf

**7. Historic Climax Plant Community and Species Composition:** Relative composition by weight of annual production on this ecological site is approximately 85-90 percent grasses and grasslike plants, 1-5 percent forbs, and 5-10 percent woody species.

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## 7a. Major Plant Species Composition – Historic Climax Plant Community (HCPC)

Common Name	Plant Symbol	Plant Group	Percent Comp.	Group Max. %	Mean Annual Precipitation (inches)			
					11	12	13	14
					(lbs./acre)	(lbs./acre)	(lbs./acre)	(lbs./acre)
<b>Grasses and Sedges 85–90%</b>					<b>986-1044</b>	<b>1105-1170</b>	<b>1224-1296</b>	<b>1343-1422</b>
Bluebunch wheatgrass	PSSP6	2	25-50		295-580	325-650	360-720	395-790
Green needlegrass	NAVI4	2	5-20		58-232	65-260	72-288	79-316
Western or Thickspike wheatgrass	PASM ELLAL	14	10-20	20	116-232	130-260	144-288	158-316
Sandberg bluegrass	POSE	12	1-5}	10	12-116 No more than 58 for any one	13-130 No more than 65 for any one	14-144 No more than 72 for any one	16-158 No more than 79 for any one
Threadleaf sedge	CAFI	12	0-5}					
Needleleaf sedge	CADU6	16	0-5}					
Blue grama	BOGR2	15	0-5}					
Prairie junegrass	KOMA	12	0-5}					
Plains reedgrass	CAMO	16	0-5}					
Other native grasses	2GP		0-5}					
Fendler's threeawn	ARPUF	11	0-T}	T	0-T	0-T	0-T	0-T
Red threeawn	ARPUL	11	0-T}					
<b>Forbs 1–5%</b>					<b>12-58</b>	<b>13-65</b>	<b>14-72</b>	<b>16-79</b>
Purple prairieclover	DAPU5	21	1-5}	5	12-58	13-65	14-72	16-79
White prairieclover	DACA7	21	1-5}					
Prairie coneflower	RACO3	23	1-5}					
Dotted gayfeather	LIPU	21	1-5}					
Silverleaf scurfpea	PSAR	23	0-5}					
Breadroot scurfpea	PSES	30	0-5}					
Hairy goldenaster	HEVI4	23	0-5}					
Prairie thermopsis	THRH	20	0-5}					
American vetch	VIAM	18	0-5}					
Wild onion	ALLIU	32	0-5}					
Milkvetch spp.	ASTRA	24	0-5}					
Hood's phlox	PHHO	28	0-5}					
Western yarrow	ACMI2	19	0-5}					
Biscuitroot spp.	LOMAT	24	0-5}					
Scarlet globemallow	SPCO	20	0-5}					
Penstemon spp.	PENST	28	0-5}					
Aster spp.	ASTER	19	0-5}					
Other native forbs	2FP		0-5}					
Twogrooved poisonvetch	ASBI2	24	0-T}	T	0-T	0-T	0-T	0-T
White point loco **	OXSE	24						
Larkspur spp. **	DELPH	24						
Death camas **	ZIGAD	32						
<b>Shrubs and Half-shrubs 5–10%</b>					<b>58-116</b>	<b>65-130</b>	<b>72-144</b>	<b>79-158</b>
Winterfat	KRLA2	35	10-5}	10	12-116 No more than 58 for any one	13-130 No more than 65 for any one	14-144 No more than 72 for any one	16-158 No more than 79 for any one
Wyoming big sagebrush	ARTRW8	37	0-5}					
Silver sagebrush	ARCA13	36	0-5}					
Nuttall's saltbush *	ATNU2	34	0-5}					
Fourwing saltbush *	ATCA2	33	0-5}					
Prairie rose	ROAR3	38	0-5}					
Fringed sagewort	ARFR4	38	0-5}					
Rubber rabbitbrush	ERNAN5	36	0-5}					
Other native shrubs	2SB		0-5}					
Broom snakeweed	GUSA2	37	0-T}	T	0-T	0-T	0-T	0-T
Plains pricklypear	OPPO	38						
<b>Total Annual Production (lbs./ac):</b>			<b>100%</b>	<b>1160</b>	<b>1300</b>	<b>1440</b>	<b>1580</b>	<b>1160</b>

\* This species tends to occur mainly in the higher precipitation areas of the RRU.

\*\* These plants are poisonous to some grazing animals, during at least some portion of their life cycle.

**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 preference to grazing animals. This

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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 Plant Community.

Cover Type	Canopy Cover %	Average Height (Inches)	Basal Cover %	Ground Cover %
Cryptogams	0-5	0.25-0.50	T-1	
All Plants				
Grasses/sedges	70-85	24	5-15	
Forbs	1-5	12	1-4	
Shrubs	0-10	24	1-4	
Litter				50-70
Coarse fragments				0-5
Bareground				10-20

### 10. Ecological Dynamics:

**10a. Major Plant Community States and Thresholds:** The following are descriptions of several plant communities that may occupy this site:

**Plant Community 1: Tall and Medium Grasses / Forbs/ Shrubs:** The physical aspect of this site in the Historical Climax (HCPC) is that of a level to undulating grassland dominated by cool season grasses, with forbs and shrubs occurring in smaller percentages. Approximately 85–90% of the annual production by weight is from grasses and sedges, 1–5% is from forbs, and 5–10% is from shrubs, half-shrubs, and cacti. Canopy cover of shrubs is typically 1–5%. Trees are not significant on this site.

Dominant species include **bluebunch wheatgrass, green needlegrass, western or thickspike wheatgrass**, and a diverse group of short grasses, such as **Sandberg bluegrass, blue grama, and prairie junegrass**. There are abundant forbs (**purple and white prairie clover, prairie coneflower, dotted gayfeather**) which occur in smaller percentages. Shrubs such as **Wyoming big sagebrush and winterfat** are common.

This plant community is well adapted to the Northern Great Plains climatic conditions. The diversity in plant species and presence of tall, deep-rooted perennial grasses allows for drought tolerance. Plants on this site have strong, healthy root systems that allow production to increase significantly with favorable moisture conditions. 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 2A: Medium and Short Grasses and Sedges/ Shrubs and Half-shrubs:** This community occurs over time with minor disturbances and lack of fire. Dominants include **western or thickspike wheatgrass, Sandberg bluegrass, and blue grama** (not matted). Bluebunch wheatgrass and green needlegrass will still be present but in smaller amounts. There may be an increase in the amount of **Wyoming big sagebrush**. Palatable and nutritious forbs will be replaced by less desirable and more aggressive species and half-shrubs such as **fringed sagewort**.

**Plant Community 2B: Medium and Short Grasses:** This community is similar to 2A, except that there is no shrub component, typically due to fire. Dominants include **western or thickspike wheatgrass, Sandberg bluegrass, and blue grama** (not matted). There will be some shifting of sagebrush between Communities 2A and 2B, depending on the occurrence and frequency of fire. A lack of fire in Community 2A tends to favor Wyoming big sagebrush. The presence of fire in a big sagebrush stand will generally reduce the density of plants, making the community more similar to 2B.

Grass biomass production and litter become reduced on Plant Communities 2A and 2B as the taller grasses become less prevalent, increasing evaporation and reducing moisture retention. Additional open space in the community can result in undesirable invader species. These plant communities provide for moderate soil stability.

**Plant Community 3: Short Grasses / Shrubs and Half-shrubs:** This is a disturbance-induced community, with dominants including **Sandberg bluegrass, blue grama, perennial forbs, fringed sagewort, and Wyoming big sagebrush**. Remnant amounts of western or thickspike wheatgrass and needleandthread may be present. Tall grasses and palatable forbs will be mostly absent. The blue grama will often tend to occur in thick mats, often making up 50% or more ground cover. There is often an increase in the amount of **plains pricklypear**.

The amount of Wyoming big sagebrush in this community can also be the result of lack of fire in Plant Community 4. Periodic fire tends to reduce the amount of big sagebrush that is present.

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**Plant Community 4: Short Grasses/ Half-Shrubs/ Biennial Forbs:** This is a disturbance-induced community, with dominants including **blue grama, Sandberg bluegrass and fringed sagewort**. It is similar to Plant Community 3, but having less of a shrub component. Common invaders include **plains pricklypear, broom snakeweed, cheatgrass, Japanese brome, and curlycup gumweed**.

Plant Communities 3 and 4 are much less productive than Plant Communities 1, 2A, or 2B, 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. This community 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, 2A, or 2B.

**Plant Community 5: Short Grasses/ Half-shrubs/ Cactus/ Annual Grasses and Forbs:** This community is the result of continual adverse disturbances. Dominants include **blue grama, plains pricklypear, fringed sagewort, and broom snakeweed**. Invaders include **cheatgrass, Japanese brome, and curlycup gumweed**.

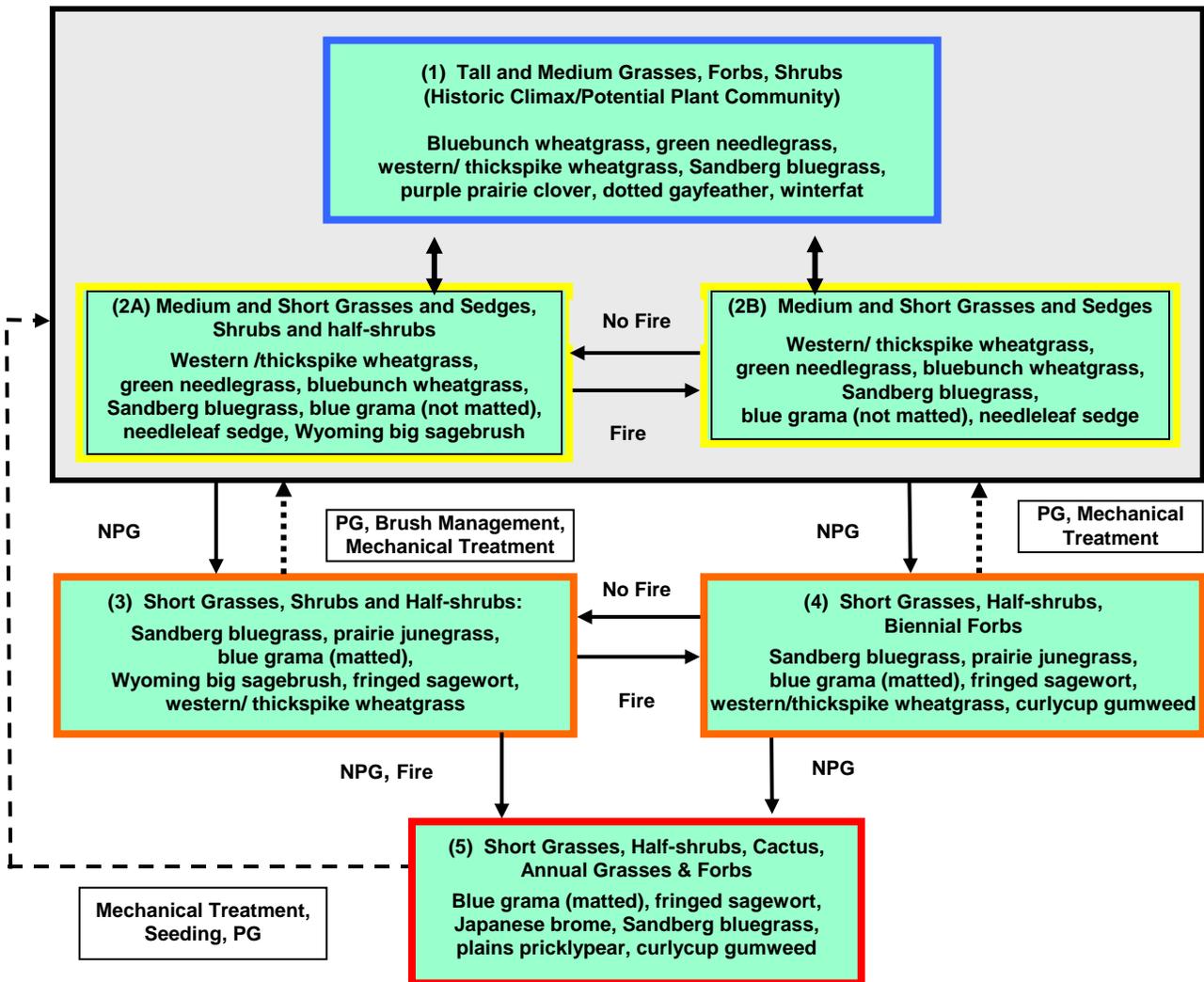
This community is often associated with prairie dog towns. Wyoming big sagebrush may also be a component depending on the fire history of the site.

Plant community 5 has extremely reduced production of desirable native plants (< 400 lbs./acre). The lack of litter and short plant heights result in higher soil temperatures, poor water infiltration rates, and increased evaporation, which gives short sod grasses and invaders a competitive advantage over the cool season tall and medium grasses. These communities have lost many of the attributes of a healthy rangeland, including good infiltration, minimal erosion and runoff, nutrient cycling and energy flow. Significant economic inputs and time would be required to move these plant communities toward a higher successional stage and a more productive plant community.

#### **Plant Communities and Transitional Pathways (State & Transition Model diagram)**

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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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.

Fire: Prescribed fire or non-prescribed wildfire.

Matted: > 50% cover

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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.

**12. Livestock Grazing Interpretations:** Managed livestock grazing is suitable on this site as it has the potential to produce an abundance of high quality forage. This is often a preferred site for grazing by livestock, and animals tend to congregate in these areas. In order to maintain the productivity of this site, grazing must be managed carefully on adjoining sites with less production to be sure livestock drift onto the Clayey site is not excessive. 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 2A or 2B (Medium and short grasses) occur, grazing management strategies need to be implemented to avoid further deterioration. These communities are still stable, productive, and healthy provided they receive proper management. These communities will respond fairly quickly to improved grazing management, including increased growing season rest of key forage plants. Grazing management alone can usually move these communities back towards the potential community.

Plant Communities 3 and 4 have substantially reduced forage production, and a high percentage of aggressive, non-palatable species. Once these plant communities become established, it will be much more difficult to restore the site 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. Brush management and mechanical treatment are often needed to restore tall perennial grasses onto this site.

Plant Community 5 has extremely limited forage production (<225 lbs. per acre), and a high percentage of non-preferred species for cattle and sheep. Seeding may be necessary to restore desirable native perennial species.

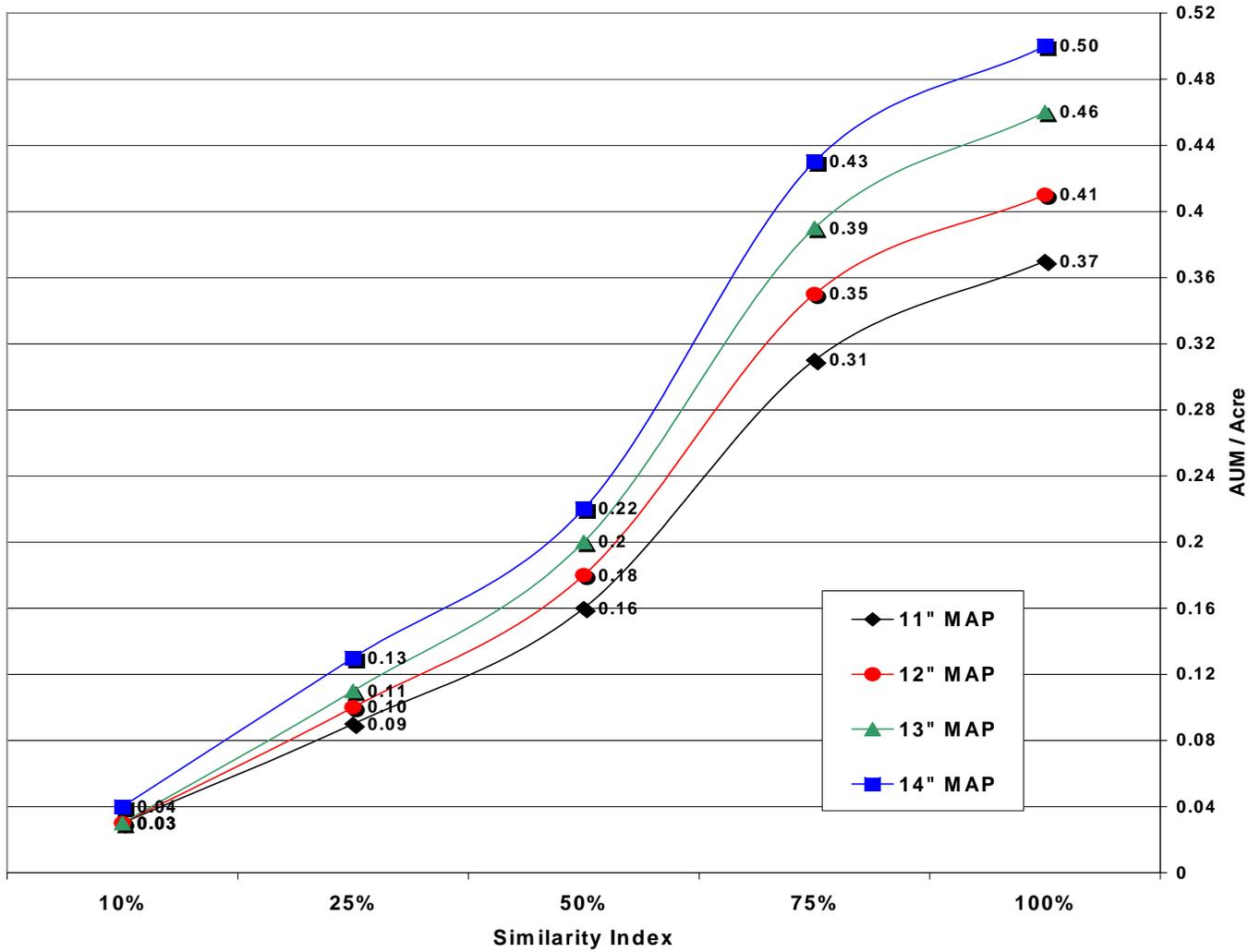
**12a. Calculating Safe Stocking Rates:** Proper stocking rates should be incorporated into a grazing management strategy that protects the resource, maintains or improves rangeland health, and is consistent with management objectives. Safe stocking rates will be based on useable forage production, and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

Calculations used to determine 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 guidance 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. These tables should not be used without on-site information collected to determine the average 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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**Stocking Rate Guide (Cattle)**  
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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
<b>1. Tall and Medium Grasses, Forbs, Shrubs (HCPC/PPC)</b>  <i>Bluebunch wheatgrass, green needlegrass, western wheatgrass, forbs, winterfat</i>  (S.I. >75%)	13–14"	1440-1580	1225-1425+	.33-.39+	2.6-3.0	1150-1350+	.31-.37+	2.7-3.2
	11–12"	1160-1300	1000-1150+	.27-.31+	3.2-3.7	925-1100+	.25-.30+	3.3-4.0
<b>2A. Medium &amp; Short Grasses, Shrubs &amp; Half-shrubs</b>  <i>Western wheatgrass, green needlegrass, bluebunch wheatgrass, Sandberg bluegrass, Wyoming big sagebrush</i>  (S.I. 40–75%)	13–14"	800-1350	475-1150	.13-.31	3.2-7.7	525-1200	.14-.33	3.1-7.0
	11–12"	650-1100	400-950	.11-.26	3.9-9.2	425-1000	.12-.27	3.7-8.6
<b>2B. Medium and Short Grasses</b>  <i>Western wheatgrass, bluebunch wheatgrass, green needlegrass, blue grama, Sandberg bluegrass</i>  (S.I. 40–75%)	13–14"	800-1350	525-1200	.14-.33	3.1-7.0	475-1150	.13-.31	3.2-7.7
	11–12"	650-1100	425-1000	.12-.27	3.7-8.6	400-925	.11-.25	4.0-9.2
<b>3. Short Grasses, Shrubs and Half-shrubs</b>  <i>Sandberg bluegrass, Wyoming big sagebrush, fringed sagewort, western/ thickspike wheatgrass</i>  (S.I. 20–40%)	13–14"	575-1105	300-600	.08-.16	6.1-12.2	325-775	.09-.21	4.7-11.3
	11–12"	465-910	225-500	.06-.14	7.3-16.3	250-650	.07-.18	5.6-14.6
<b>4. Short Grasses, Half-shrubs, Biennial Forbs</b>  <i>Sandberg bluegrass, prairie junegrass, fringed sagewort, western wheatgrass</i>  (S.I. 20–40%)	13–14"	500-1025	275-625	.08-.17	5.9-13.3	250-675	.07-.18	5.4-14.6
	11–12"	400-850	225-500	.06-.14	7.3-16.3	200-550	.05-.15	6.7-18.3
<b>5. Short Grasses, Half-Shrubs, Cactus, Annuals</b>  <i>Blue grama, fringed sagewort, Japanese brome, curlycup gumweed, plains pricklypear</i>  (S.I. < 20 %)	11–14"	230-630	50-225	.01-.06	16.3-73.2	75-300	.02-.08	12.2-48.8

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 915 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:** Refer to Livestock Forage Preference table in Field Office Technical Guide, Section II.

**13. Wildlife Interpretations:** The Clayey ecological site occurs over large acreages on the Northern Great Plains except where it is fragmented by conversion to cropland, which is significant in many areas. Habitat fragmentation of this site may have contributed to the decline of some “area sensitive” wildlife species, particularly such ground-nesting birds as the grasshopper sparrow. This site is home to a diverse native wildlife complex. Historically, huge herds of migratory bison and pronghorn as well as large numbers of sharp-tailed and sage grouse were probably the dominant “game” species in addition to a wide variety of ground-nesting songbirds, waterfowl and shorebirds, small mammals and mammalian predators. Grazing patterns, topographic diversity, extensive acreages and interspersions with other ecological sites provide niches for numerous wildlife species. Small mammal diversity and abundance is high which, in turn, supports a varied raptor population. Historically, vast prairie dog towns provided habitat for such species as the black-footed ferret, burrowing owl, mountain plover, ferruginous hawk, and swift fox. Invasive plant species such as leafy spurge, Canada thistle and several knapweeds contribute to a loss of biodiversity within this ecological site. Wildlife water requirements are provided by springs and seeps, intermittent and perennial streams and, in modern times, numerous artificial ponds and livestock pipelines. These areas are locally important for northern leopard frogs, tiger salamanders, and a number of toad species, all of which feed on a variety of insects. Grazing, fire, drought cycles, and insect population fluctuations create a shifting mosaic of wildlife habitats across this site.

**Plant Community 1: Tall Grasses/ Forbs/ Shrubs (HCPC or PPC):** The diversity of plant species and life forms provides feeding substrate for a variety of pollinating insects. Grasshopper and Mormon cricket infestations occasionally consume the majority of the herbaceous vegetation, especially during drought years. A variety of warm and cool water fish species inhabit the intermittent and perennial streams associated with this community. Northern pike, lake chub, carp, a variety of suckers and walleye are examples. Common reptile and amphibian species include tiger salamanders in ponds and stock tanks, Woodhouse’s toad, western chorus frogs, bull snakes, rattlesnakes, and three species of garter snakes. The diversity of grass stature and life forms, along with scattered shrubs and a variety of forbs, provides habitat for many bird species including the upland sandpiper, loggerhead shrike, grasshopper and savanna sparrow, chestnut-collared longspur and western meadowlark. This community is especially favorable for ground-nesting birds because of the abundant residual plant material and litter available for nesting, escape and thermal cover. Diverse prey populations are available for raptors such as ferruginous and Swainson’s hawks. When this plant community is adjacent to large blocks of sagebrush-grassland, it can provide quality sage grouse lek sites and brood habitat. The predominance of grasses plus a diversity of forbs, shrubs and half-shrubs in this community favors grazers and mixed feeders such as bison, pronghorn and elk. Complex plant structural diversity and litter cover provide habitat for a wide array of small mammals (both seed eaters, i.e., deer mice and herbivores, i.e., voles and jackrabbits) and neotropical migratory birds.

**Plant Community 2A: Medium and Short Grasses and Sedges / Shrubs and Half-shrubs:** The decline in forb diversity reduces the variety of pollinating insects compared to the HCPC or PPC although insects may be quite abundant in this community. Wyoming big sagebrush, with canopy cover of 15-30%, and an understory of grasses and forbs, is excellent nesting, winter, brood-rearing and foraging habitat for sage grouse. Other obligate sagebrush-grassland species, notably Brewer’s sparrow, also benefit from an increase in sagebrush cover. When residual grass and litter cover decrease in this community, ground nesting bird habitat values decline. This community often provides important winter range for mule deer and pronghorn. The sagebrush crowns break up hard crusted snow and provide about 15% protein and 40-60% digestibility for ungulates. Small mammal species composition may shift toward seed eaters such as the deer mouse and away from herbivores like the sagebrush vole.

**Plant Community 2B: Medium and Short Grasses:** The diversity of insect pollinators may be reduced as desirable forbs are replaced by more aggressive species. The partial loss of structural diversity makes this plant community somewhat less attractive to the variety of wildlife species using the HCPC or PPC. A decrease in residual plant material and litter cover is usually associated with degradation of the HCPC, which makes this community less attractive for ground-nesting birds. Pronghorn make considerable use of this type because of forb and half-shrub availability in the generally open landscape.

**Plant Community 3: Short Grasses/ Shrubs and Half-shrubs:** Insect variety is considerably reduced at this stage because palatable forbs are mostly absent. Insects, particularly grasshoppers, may be very abundant during high points in population cycles. Heavy stands of big sagebrush can provide winter cover and foraging habitat for mule deer, elk, pronghorn and sage grouse. However, a decline in herbaceous cover and litter reduces overall wildlife species diversity and habitat value for amphibians, ground-nesting birds and small mammals. Prairie dogs will have an easier time establishing and expanding towns in this community to the benefit of burrowing owls, mountain plovers, and black-footed ferrets.

## SECTION II Ecological Site Description—Rangeland

TECHNICAL GUIDE  
Clayey (Cy), 11–14" MAP

**Plant Community 4: Short Grasses/ Half-shrubs/ Biennial Forbs:** Insect diversity is considerably lower than in higher seral communities and population fluctuations of grasshoppers may be extreme. Amphibian habitat is degraded following loss of litter cover and resulting warming and drying of the soil. Ground-nesting bird habitat value is significantly reduced because of lack of ground cover and residual vegetation in spring. Some species, such as the mountain plover and horned lark, may nest on the open ground surface. Pronghorn may forage on fringed sagewort, but big game habitat value is poor following loss of desirable forbs and grasses.

**Plant Community 5: Short Grasses/ Half-shrubs/ Cactus/ Annual Grasses and Forbs:** Insect populations fluctuate wildly and are represented by fewer species than higher seral communities. Amphibian habitat is very poor on the hot, dry ground surface. When big sagebrush cover exceeds about 15%, this community may provide winter sage grouse habitat; nest cover for sage grouse and most other ground-nesting birds is poor because of a lack of standing herbaceous material and surface litter. Lek sites for sage and sharp-tailed grouse may be available in this type. General wildlife habitat is of low value. Shrubs and half-shrubs provide some winter range value for pronghorn and mule deer.

**13a. Plant Preferences for Wildlife:** Refer to Wildlife Forage Preference table in Field Office Technical Guide, Section II.

**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 and D. Soils have a slow infiltration rate when thoroughly wetted and consist chiefly of soils with moderately fine to fine textures.

**15. Recreation and Natural Beauty:** This site provides some recreational opportunities for hiking, horseback riding, big game and upland bird hunting. The forbs have flowers that appeal to photographers. This site provides valuable open space and visual aesthetics. Caution should be used during wet weather periods.

**16. Wood Products:** None

**17. Site Documentation:**

**Authors:** Original: NRCS, 1983

Revised: MJR, REL, RSN, POH, 2003

**Supporting Data for Site Development:**

NRCS–Production & Composition Record for Native Grazing Lands (Range-417): 10

BLM–Soil & Vegetation Inventory Method (SVIM) Data: 2

NRCS–Range Condition Record (ECS-2): 25

NRCS–Range/Soil Correlation Observations & Soil 232 notes: 25

Ecological Site Reference: NRCS 417 No.: Wheatland County 503, Golden Valley County 504

**Field Offices where this site occurs within the state:**

Big Sandy	Columbus	Harlowton	Roundup
Big Timber	Crow Agency	Joliet	Stanford
Billings	Fort Belknap	Lewistown	White Sulphur Springs
Chinook	Hardin	Malta	Winnett

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

Loretta J. Metz  
**State Rangeland Management Specialist**

10/08/04  
**Date**

## Ecological Site Description—Rangeland

Clayey (Cy), 11–14" MAP

MLRA: 58AC – Sedimentary Plains, Central  
R058AC041MT



Clayey, 11-14" MAP,  
Sedimentary Plains, Central  
Plant Community 1  
HCPC  
Golden Valley County  
Western wheatgrass, green  
needlegrass



Clayey, 11-14" MAP,  
Sedimentary Plains, Central  
Plant Community 1  
HCPC



Clayey, 11-14" MAP,  
Sedimentary Plains, Central  
Plant Community 2B  
HCPC  
Golden Valley County

## Ecological Site Description—Rangeland

Clayey (Cy), 11–14" MAP

MLRA: 58AC – Sedimentary Plains, Central  
R058AC041MT



Clayey, 11-14" MAP,  
Sedimentary Plains, Central  
Plant Community 2B



Clayey, 11-14" MAP,  
Sedimentary Plains, Central  
Plant Community 2A



Clayey, 11-14" MAP,  
Sedimentary Plains, Central  
Plant Community 2A  
Golden Valley County

## Ecological Site Description—Rangeland

Clayey (Cy), 11–14" MAP

MLRA: 58AC – Sedimentary Plains, Central  
R058AC041MT



Clayey, 11-14" MAP,  
Sedimentary Plains, Central  
Plant Community 3



Clayey, 11-14" MAP,  
Sedimentary Plains, Central  
Plant Community 3  
Golden Valley County  
Sandberg bluegrass, western  
wheatgrass, Nuttall's saltbush,  
Wyoming big sagebrush



Clayey, 11-14" MAP,  
Sedimentary Plains, Central  
Plant Community 3  
Musselshell County

## Ecological Site Description—Rangeland

Clayey (Cy), 11-14" MAP

MLRA: 58AC – Sedimentary Plains, Central  
R058AC041MT



Clayey, 11-14" MAP,  
Sedimentary Plains, Central  
Plant Community 3  
Musselshell County