

## Ecological Site Description—Rangeland

Wet Meadow, 10–14" MAP

MLRA: 58A – Sedimentary Plains, East  
 MLRA: 60B – Pierre Shale Plains, East  
 R058AE009MT, R060BE587MT

**Site Name:** Wet Meadow (WM), 10–14" Mean Annual Precipitation (MAP)

**Site Number:** R058AE009MT, R060BE587MT

**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 nearly level to slightly concave areas. Free water will be at or near the surface causing the upper part of the soil to be saturated, or nearly so, throughout most of the growing season. It may also occur around the margins of ponds. Slopes are mainly 1% or less. This site is too wet and poorly aerated for most plants, but not wet enough for true aquatics such as cattails. These are also considered to be "lentic" (standing water) riparian/wetland areas.

**Elevation (feet):** 1,900–3,500

**Landform:** fen, bog, marsh

**Slope (percent):** 0–1

**Depth to Water Table (inches):** 0–24

**Flooding:** rare

**Ponding:** depth (inches): 1–4  
 frequency: occasional to frequent (>5% chance in any year)  
 duration (days): can be up to about 30

**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:** (Cowardin System)

<u>SYSTEM:</u>	<u>SUBSYSTEM:</u>	<u>CLASS:</u>	<u>SUBCLASS:</u>
Lacustrine	Littoral	Unconsolidated Shoreline	Permanently or Semi-permanently, or Seasonally Flooded
Palustrine	N/A	Persistent Emergent Wetland	Permanently or Semi-permanently, or Seasonally Flooded, or Saturated

**4. Associated sites:** Overflow, Subirrigated, Silty, Clayey, Silty-Steep, and Clayey-Steep.

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### 5. **Similar sites:** Subirrigated, Saline Lowland, Overflow, Riparian Meadow, Stream Terrace.

The Subirrigated site differs mainly by having a permanent water table at about 3 feet of depth for most of the growing season (i.e., it is usually not wet to the surface, except occasionally for short periods of time during runoff or after a high intensity storm).

The Saline Lowland site differs mainly by being salt affected.

The Overflow site differs mainly by being associated with ephemeral streams and having no permanent water table.

The Riparian Meadow site differs mainly by being adjacent to perennial or intermittent streams and being frequently flooded.

The Stream Terrace site may have a permanent water table, but it usually is at a deeper depth.

### 6. **Soils:** These soils are hydric. They often have organic (Histic) surfaces or organic profiles. They are mainly deep to very deep. They will have a permanent water table (free water) within about two feet of the surface, or less, keeping the upper part of the soil very moist or saturated for most of the growing season. Textures are not significant, tending to be mainly medium (loamy) to fine (clayey). The organic soils will tend to be mucky textured. These soils are non-saline and non-sodic, but may be calcareous or acid.

**Parent material (kind):** alluvium

**Parent material (origin):** mixed

**Surface textures:** will vary, mainly loamy or clayey

**Surface texture modifiers:** mucky

**Depth (inches):** greater than 40

**Soil surface permeability (inches per hour):** mainly moderate (0.6–2.0)

**Available Water Holding Capacity to 40" (inches):** free water occurs within about 24 inches of the surface

**Drainage Class:** poorly

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

**Surface Sodium Absorption Ratio (SAR):** negligible

**Surface Reaction (pH) (1:1 water):** slightly acid to slightly alkaline (6.1–7.8)

**6a. Representative Soils:** Soil map units representing this ecological site do not exist for the counties in this MLRA/RRU. Rather, they are identified on soil survey maps with a spot symbol as they are relatively small. The user is cautioned that more than one symbol may be used to show wet areas. An on-site investigation is usually necessary to verify that the symbol represents this ecological site.

**7. Plant Community and Species Composition:** The physical aspect of this site in Historical Climax is that of a level grassland dominated by cool and warm season sedges, rushes, and grasses, with forbs occurring in smaller percentages. A few woody species, such as willows may be present. When they do occur, they often will be around the perimeter of this site, or on soils that are more well-drained. Approximately 45% of the annual production by weight is from sedges and rushes, 45% is from grasses, 10% is from forbs, and a trace amount may be from shrubs. Canopy cover of shrubs is 0 to 0.5%.

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)
<b>Grasses 40–45%</b>					<b>2475</b>	<b>2585</b>	<b>2700</b>	<b>2710</b>	<b>2925</b>
Prairie cordgrass	SPPE	5	15-25		825-1375	860-1440	900-1500	940-1565	975-1625
Switchgrass	PAVI2	5	0-5		0-275	0-285	0-300	0-315	0-325
Slender wheatgrass	ELTRT	2	1-5		55-275	58-285	60-300	62-315	65-325
Bluejoint reedgrass	CACA4	6	1-15		55-825	58-860	60-900	62-940	65-975
Slimstem reedgrass	CANE	6	1-10		55-550	58-575	60-600	62-625	65-650
Western wheatgrass	PASM	14	0-5		0-275	0-285	0-300	0-315	0-325
Bearded wheatgrass	ELTRS	6	1-5		55-275	58-285	60-300	62-315	65-325
Tufted hairgrass	DECE	2	5-10		275-550	285-575	300-600	315-625	325-650
American mannagrass	GLGR	6	5-15		275-825	285-860	300-900	315-940	325-975
Fowl mannagrass	GLST	2	5-10		275-550	285-575	300-600	315-625	325-650
Big bluestem	ANGE	1	0-5		0-275	0-285	0-300	0-315	0-325
American sloughgrass	BESY	2	5-10		275-550	285-575	300-600	315-625	325-650
Mat muhly	MURI	16	0-5}	5	55-275	58-285	60-300	62-315	65-325
Meadow barley	HOBR2	10	1-5}						
Other grasses	2GP		0-5}						
Foxtail barley	HOJU	12	0-T	T	0-T	0-T	0-T	0-T	0-T
<b>Sedges &amp; Rushes 40–45%</b>					<b>2475</b>	<b>2590</b>	<b>2700</b>	<b>2815</b>	<b>2925</b>
Beaked sedge	CAUT	6	10-20		550-1100	575-1150	600-1200	625-1250	650-1300
Nebraska sedge	CANE2	6	5-15		275-825	285-860	300-900	315-940	325-975
Clustered field sedge	CAPR5	16	1-5		55-275	58-285	60-300	62-315	65-325
Woolly sedge *	CALA30	6	5-10		275-550	285-575	300-600	315-625	325-650
Woollyfruit sedge *	CALA11	6	5-10		275-550	285-575	300-600	315-625	325-650
Brevior sedge	CABR10	2	1-5		55-275	58-285	60-300	62-315	65-325
Smallwing sedge	CAMI7	10	1-5		55-275	58-285	60-300	62-315	65-325
Other sedges	CAREX		0-5		0-275	0-285	0-300	0-315	0-325
Baltic rush	JUBA	14	1-5		55-275	58-285	60-300	62-315	65-325
Slender rush	JUTE	2	0-5		0-275	0-285	0-300	0-315	0-325
Torrey's rush	JUTO	6	0-5		0-275	0-285	0-300	0-315	0-325
Tuberous rush	JUNO2	6	0-5		0-275	0-285	0-300	0-315	0-325
Other rushes	JUNCU		0-5		0-275	0-285	0-300	0-315	0-325
<b>Forbs 5–10%</b>					<b>550</b>	<b>575</b>	<b>600</b>	<b>625</b>	<b>650</b>
Field mint	MEAR4	23	1-5}	10	55-275 no more than 550 for this group	58-285, no more than 575 for this group	60-300 no more than 600 for this group	62-315 no more than 625 for this group	65-325 no more than 650 for this group
Northwest cinquefoil	POGR9	24	1-5}						
Blue lettuce	LATA	19	0-5}						
Leafy aster	ASFO	23	1-5}						
Blue-eyed grass	SISA4	28	1-5}						
Silverweed cinquefoil	POAN5	20	1-5}						
Horsemint	MOFI	24	1-5}						
Other native forbs	2FP		0-5}						
<b>Shrubs 0–T %</b>					<b>0 – T</b>	<b>0 – T</b>	<b>0 – T</b>	<b>0 – T</b>	<b>0 – T</b>
Silver buffaloberry	SHAR	36	0-T	T	0-T	0-T	0-T	0-T	0-T
Willows **	SALIX		0-T						
Rose spp.	ROSA5	38	0-T						
Other native shrubs	2SB		0-T						
<b>Total Annual Production: (lbs./acre)</b>			<b>100%</b>		<b>5500</b>	<b>5750</b>	<b>6000</b>	<b>6250</b>	<b>6500</b>

\* Woolly sedge typically occurs on mineral soils, woollyfruit sedge typically occurs on organic soils.

\*\* The willow species that are most likely to occur in this MLRA/RRU include sandbar (coyote), yellow, and peachleaf.

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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 above ground 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	0 – T	0 – T	0.25
Grasses/ sedges	40 – 50	70 - 90	24
Forbs	1 – 3	1 – 5	18
Shrubs	0 – T	0 – T	24
Litter	40 – 50		
Coarse fragments	0 – T		
Bare ground	0 – T		

**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 highly resilient to disturbance as it has essentially no limitations for plant growth, except for growing season. Changes may occur to the Historic Climax Plant Community due to management actions and/or climatic conditions, such as a drop in water table level due to prolonged drought conditions. Under continued adverse impacts, a moderate decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments, this site can readily return to the Historic Climax Plant Community (HCPC).

Continual adverse impacts to the site over a period of years, including a change in the hydrology, will result in a departure from the HCPC. A decrease of the tall and medium, palatable species such as **prairie cordgrass, American and fowl mannagrass, tufted hairgrass, bluejoint and slimstem reedgrass, and beaked, Nebraska, woolly, and brevior sedges** will occur. These plants will be replaced by a mixture of short sedges, rushes, and grasses, including **Baltic rush, western wheatgrass, meadow barley, mat muhly, smallwing, and clustered field sedges** as well as several species of non-palatable forbs. Baltic rush often becomes dominant on this site provided that the water table remains at or near its historic levels.

Continued deterioration results in an abundance of short grasses and short sedges, non-native grasses and forbs, and annuals. Plants that are not a part of the Historic Climax Plant Community that are most likely to invade are **foxtail barley, Kentucky, Canada, and fowl bluegrass, smooth brome, redtop, Canada thistle, dandelion, leafy spurge, sulfur cinquefoil, curly dock**, annuals, and other weedy species. These species often occur when the water table is deeper than its historic levels. **Purple loosestrife** is potentially a serious invader on this site.

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

**Plant Community 1: Tall and Medium Sedges and Grasses:** 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 contains a high diversity of tall and medium height, cool and warm season sedges, rushes, and grasses (**beaked sedge, Nebraska sedge, brevior sedge, and woolly/ woollyfruit sedge, prairie cordgrass, American and fowl mannagrass, bluejoint reedgrass, slimstem reedgrass**), and short grasses, sedges, and rushes (**mat muhly, smallwing and clustered field sedges, and Baltic rush**). There are abundant forbs which occur in small percentages.

This plant community is well adapted to the Northern Great Plains climatic conditions as well as the presence of a permanent water table. The presence of available water throughout the growing season provides a very favorable soil-water-plant relationship. The diversity in plant species allows for resistance to fluctuation in the depth to the water table. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation, depth to the water table, and temperature). 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 2: Medium Sedges, Grasses & Rushes/ Forbs:** With slight disturbances to the site, the HCPC/PPC will tend to change to a community dominated by medium grasses, sedges, and forbs, such as **slimstem reedgrass, tufted hairgrass, smallwing sedge, clustered field sedge, Baltic rush and silverweed cinquefoil**. Most of the taller, more palatable sedges and grasses (beaked sedge, Nebraska sedge, brevior sedge, and woolly sedge, prairie cordgrass, American and fowl mannagrass, bluejoint reedgrass) will be present in smaller percentages. Palatable and nutritious forbs will be replaced by less desirable and more aggressive species.

Biomass production and litter become reduced on the site as the taller sedges and grasses are replaced by shorter plants, increasing evaporation and reducing moisture retention. Additional open space can result in undesirable invader species. This plant community provides for moderate soil stability. This site can be susceptible to excessive hummocking, further altering the site's hydrology and stability.

**Plant Community 3: Medium & Short Grasses, Sedges, and Rushes:** With continued heavy disturbance the site will become dominated by short, less palatable grasses and sedges such as **Baltic rush, western wheatgrass, mat muhly, meadow barley, and foxtail barley**. Non-native species such as **Kentucky, Canada, or fowl bluegrass, smooth brome, reedtop, Canada thistle, and dandelion** become more abundant, especially if the water table has lowered. The taller grasses and sedges will occur only occasionally. However, **Nebraska sedge** often remains since it can be somewhat resistant to grazing pressure because of its robust system of roots and rhizomes. Palatable forbs will be mostly absent.

This plant community is less productive than Plant Community 1 or 2. The lack of litter and shorter plant heights result in higher soil temperatures, poor water infiltration rates, and higher evaporation, thus eventually favoring species that are more adapted to drier conditions. This community has lost many of the attributes of a healthy rangeland, including good infiltration, minimal erosion and runoff, nutrient cycling and energy flow.

This community will respond positively to improved grazing management, but significant economic inputs and time would be required to move this plant community toward a higher successional stage and a more productive plant community.

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**Plant Community 4: Short Grasses/ Rushes/ Non-Native Grasses & Forbs:** Continued disturbance to this site generally results in a plant community comprised mainly of short grasses and rushes, with a predominance of non-native grass and forb species. Dominant species include **Baltic rush, mat muhly, meadow barley, foxtail barley, Kentucky bluegrass, redtop, reed canarygrass, Canada thistle, and dandelion**. This community is also often a result of a lower water table.

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 either Plant Community 1 or 2.

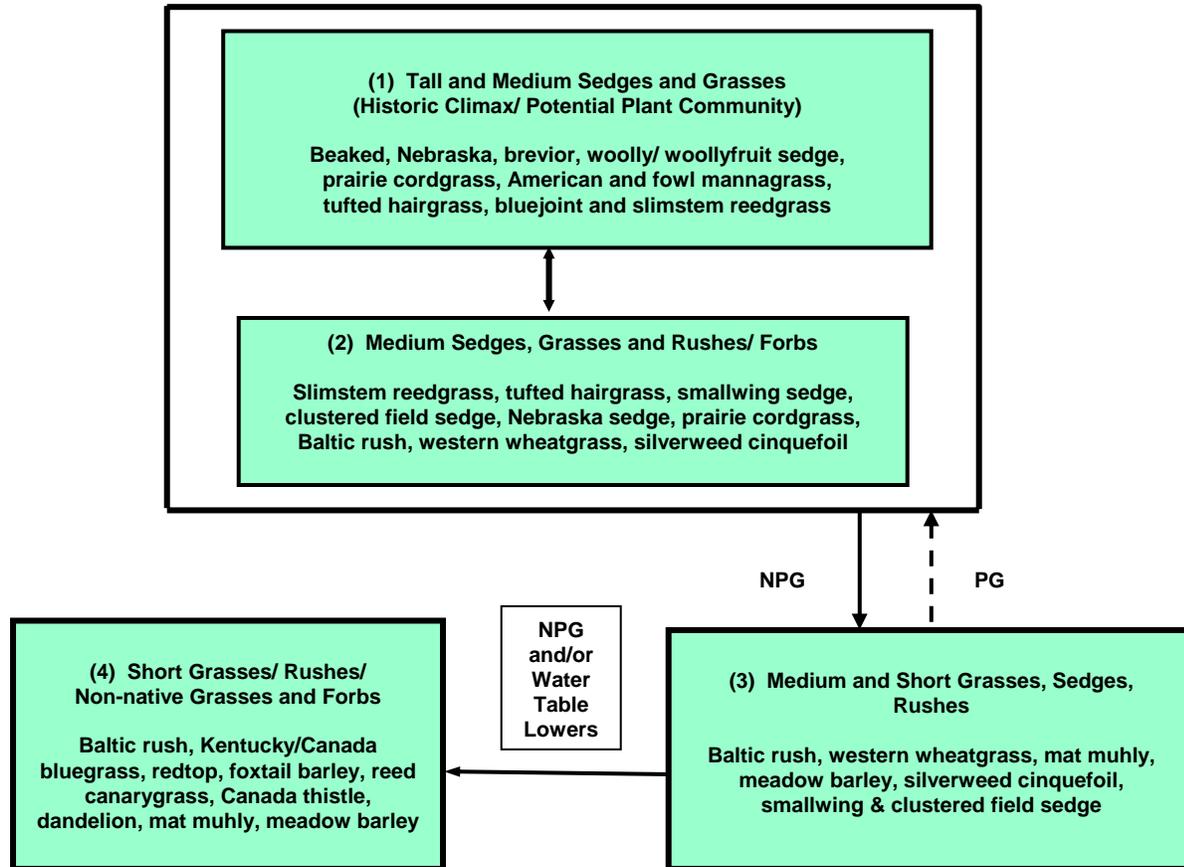
**10b. Plant Communities and Transitional Pathways (State and Transition Model):** Transitions in plant community composition occur along a gradient that is not linear. Many processes are involved in the changes from one community to another. Changes in climate, elevation, soils, landform, fire patterns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

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 the growing season. Native warm-season plants begin growth about mid May and also continue to the end of the growing season because of adequate soil moisture being 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: MT0816**

Growth Curve Description: Includes all sedimentary plains sites with a permanent water table.

**Totals for Each Month**

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	0	5	20	25	20	20	10	0	0	0

**Cumulative Totals by Month**

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	0	5	25	50	70	90	100	0	0	0

**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 due to the succulent forage, and animals tend to congregate in these areas. In order to maintain the productivity of this site, stocking rates must be managed carefully on adjoining sites with less production to be sure livestock drift onto the Wet Meadow 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.

Grazing this site when the upper part of the soil is wet can cause compaction. Hummocking (frost heaving) is often a common feature of this site. Hummocking can be exacerbated if grazing impacts becomes excessive.

Whenever Plant Community 2 (medium grasses and sedges) 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 since a good seed source of the taller sedges and grasses should still exist.

Plant Communities 3 and 4 have severely reduced forage production, and contain a high percentage of non-palatable species. Once this site is occupied by these communities, it will be significantly 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.

Once established, plants such as Kentucky bluegrass, redtop, reed canarygrass, and Canada thistle are very difficult to remove by grazing alone. The potential for using mechanical treatment to improve site health can be limited, depending on the depth to the water table.

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**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 initial 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.

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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 Sedges &amp; Grasses (HCPC/PPC)</b>  <i>Beaked &amp; Nebraska sedge, prairie cordgrass, fowl American mannagrass, bluejoint reedgrass</i>  (S.I. >70%)	13–14"	6000-6500	5100-5500+	1.6-1.75+	.5 – .6	4500-4900+	1.4-1.55+	.65 – .7
	10–12"	5500-5750	4700-5000+	1.5–1.6+	.6 – .65	4100-4300+	1.3 – 1.4+	.7 – .75
<b>2. Medium Sedges Grasses, Rushes/ Forbs</b>  <i>Slimstem reedgrass, tufted hairgrass, clustered field sedge, Nebraska sedge, prairie cordgrass, Baltic rush, silverweed cinquefoil</i>  (S.I. 50–70%)	13–14"	4800-5200	3850 - 4150	1.2 – 1.3	.75 – .8	4100 - 4400	1.3 – 1.4	.7 – .75
	10–12"	4400-4600	3500 - 3700	1.1 – 1.2	.8 – .9	3750 - 3900	1.2 – 1.25	.8 – .85
<b>3. Medium &amp; Short Grasses, Sedges, Rushes</b>  <i>Baltic rush, western wheatgrass, mat muhly, meadow barley, short sedges</i>  (S.I. 30–50 %)	10–14"	4100-4900	3300-3900	1.0 – 1.2	.8 – 1.0	3500 - 4150	1.1 – 1.3	.75 – .9
<b>4. Short Grasses/ Rushes/ Non-native Grasses &amp; Forbs</b>  <i>Baltic rush, Kentucky bluegrass, redbtop, foxtail barley, dandelion, Canada thistle, mat muhly</i>  (S.I. < 30 %)	10–14"	2750-3250	2200 - 2600	.7 – .8	1.25-1.4	2350 - 2750	.75 – .9	1.1 – 1.3

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;  
Summer (SU) = July, Aug., Sept.;

Spring (SP) = April, May, June;  
Fall (F) = Oct., Nov., Dec.

PLANT NAME	Cattle				Sheep			
	W	SP	SU	F	W	SP	SU	F
Prairie cordgrass	U	D	U	U	U	D	U	U
Switchgrass	P	P	P	P	P	P	P	P
Slender wheatgrass	P	P	P	P	D	P	P	D
Bluejoint reedgrass	P	P	P	P	D	D	D	D
Slimstem reedgrass	P	P	P	P	D	D	D	D
Western wheatgrass	P	D	D	P	D	D	D	D
Bearded wheatgrass	P	P	P	P	D	P	P	D
Fowl bluegrass *	P	P	P	P	D	D	D	D
Tufted hairgrass	P	P	P	P	D	D	D	D
Fowl mannagrass	P	P	P	P	P	P	P	P
Big bluestem	P	P	P	P	P	P	P	P
American mannagrass	P	P	P	P	P	P	P	P
American sloughgrass	P	P	P	P	D	D	D	D
Mat muhly	N	U	U	N	N	N	N	N
Meadow barley	N	N	N	N	N	N	N	N
Foxtail barley	N	N	N	N	N	N	N	N
Other grasses	D	D	D	D	D	D	D	D
Nebraska sedge	P	P	P	P	D	P	P	P
Beaked sedge	D	D	D	D	D	D	D	D
Woolly fruit sedge	U	U	U	U	U	U	U	U
Woolly sedge	P,D	P,D	P,D	P,D	P	P	P	P
Brevior sedge	D	D	D	D	D	D	D	D
Clustered field sedge	D	D	D	D	D	D	D	D
Smallwing sedge	D	D	D	D	U	U	U	U
Other sedges	D	D	D	D	U	U	U	U
Baltic rush	N	U	N	N	N	U	N	N
Other rushes	N	N	N	N	N	N	N	N
Field mint	N	U	U	N	U	D	D	U
Northwest cinquefoil	N	N	N	N	N	D	D	N
Leafy aster	N	U	U	N	N	D	D	N
Blue-eyed grass								
Silverweed cinquefoil	N	N	N	N	N	D	D	N
Horsemint	N	U	U	N	U	D	D	U
Blue lettuce								
Other native forbs	N	N	N	N	U	D	D	U
Willows	D	D	D	P	D	D	P	P
Rose	U	D	D	U	D	D	D	D
Silver buffaloberry	N	N	N	N	N	U	U	N
Other native shrubs	N	N	N	N	U	U	U	U

\* Non-native species

## Ecological Site Description—Rangeland

Wet Meadow, 10–14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE009MT, R060BE587MT

**13. Wildlife Interpretations:** The wet meadow ecological site provides wildlife habitat benefits out of proportion to its minor occurrence on the overall landscape. Saturated soil conditions throughout much of the growing season support at least three times the vegetative production found on adjacent semi-arid uplands. The resulting structural diversity, cover value, food supply, and moist environment support a wide variety of wildlife species including animals restricted to the wet meadow environment and mobile species using a complex of habitats throughout the year. Historically, this site was used by large herds of migratory ungulates, waterfowl and other wetland-dependent species. Since livestock are attracted to this ecological site due to abundant green forage, the HCPC has often been altered by continuous grazing practices to more simplified, less productive plant communities which support fewer wildlife species. Kentucky bluegrass, redtop and Canada thistle are common invasive species which now dominate many wet meadow sites and reduce biodiversity.

**Plant Community 1: Tall and Medium Sedges and Grasses (HCPC or PPC):** The moist environment and abundance of forbs support a diverse assemblage of insects and other invertebrates which feed a wide variety of wildlife species. Amphibians, a “keystone species” group because of their value as indicators of environmental disturbance, are represented by species such as the northern leopard frog and Woodhouse’s toad. Three species of garter snakes and, in the northeast corner of the state, the smooth green snake, are representative reptiles. The dense herbaceous cover attracts a number of breeding birds including the upland sandpiper, common snipe, savanna sparrow and LeConte’s sparrow. Sage grouse find succulent forbs and insects when surface water is not present. Northern harriers and short-eared owls hunt this site for meadow voles and other small mammals including the western jumping mouse and common shrew. The predominance of grasses and sedges favors grazers and mixed feeders like bison and elk.

**Plant Community 2: Medium Sedges, Grasses, Rushes/ Forbs:** Structural habitat diversity declines with the reduction/elimination of tall grasses and sedges. Insects and other invertebrates may still be abundant but less diverse. Amphibians preferring tall, dense vegetation, such as the northern leopard frog, are less common than in the HCPC/PPC. Nesting birds are more susceptible to predation as the plant canopy opens up. Small mammals are also more vulnerable to predators and species diversity declines. Cover and forage value for big game animals declines with the loss of tall, warm and cool season grasses and sedges.

**Plant Community 3: Medium and Short Grasses, Sedges, & Rushes:** At this stage, wildlife habitat values have significantly declined. The loss of native forbs reduces insect species diversity considerably, although dandelion, Canada thistle and other forbs still host some species. Loss of ground cover and warmer surface temperatures inhibit amphibians. This community is still used for feeding by a number of bird species but nesting cover quality is very poor for all but a few. Killdeer, for example, will nest in this community. Small mammal species diversity declines significantly with the loss of plant and litter cover. The seed-eating deer mouse may increase. Big game habitat quality is poor because palatable, nutritious grass and sedge species have been removed and the green feed period has been shortened.

**Plant Community 4: Short Grasses/ Rushes/ Non-native Grasses and Forbs:** This community has very limited value for all but a few wildlife species. Insect and other invertebrate populations are much less diverse compared to later successional stages. Amphibians are represented by fewer individuals and species. Leopard frogs are probably absent. Disturbance-tolerant breeding birds are more numerous, including the killdeer and, possibly, the piping plover (especially if the site is somewhat saline). Sage grouse may continue to seek insects and succulent forbs (i.e., dandelion) here but cover value is low and predators may take a heavy toll. Small mammal populations are less diverse, shifting to more seed-eating species compared to a predominance of herbaceous voles present in higher seral stages. Big game cover value is almost non-existent and forage value is limited and shorter in duration.

# Ecological Site Description—Rangeland

Wet Meadow, 10–14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE009MT, R060BE587MT

## 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,D	P,D	P	D	P,D	D	D
Annual grasses	N	P,D	N	D	N	P,D	N	D
Sedges	D	U	U	U	D	D	D	D
Rushes	U	U	U	U	N	U	U	U
Foxtail barley	N	U	U	N	N	U	U	N
Field mint	U	U	U	U	N	U	N	N
Northwest cinquefoil	U	U	U	U	U	U	U	U
Leafy aster	U	P	D	U	N	D	D	N
Blue-eyed grass	N	U	N	N	N	N	N	N
Silverweed cinquefoil	U	U	U	U	U	U	U	U
Horsemint	U	U	U	U	N	U	N	N
Other native forbs	D	D	D	D	D	D	D	D
Silver buffaloberry	U	u	u	U	P,D	P,D	U	P,D
Willows	D,U	D,U	D,U	D,U	P,D	P,D	P,D	P,D
Rose	P	P	P	P	P	P	P	P

**14. Hydrology Data:** The runoff potential for this site is high. Runoff curve numbers generally range from 79 to 88. The soils associated with this ecological site are generally in Hydrologic Soil Group D. The infiltration rates for these soils will normally be moderate.

A drop in the water table elevation, such as a result of several years of drought conditions will result in a change in the plant community to more dryland species, particularly non-native species such as Kentucky bluegrass, redbud, and Canada thistle.

Good hydrologic conditions exist on rangelands if plant cover (grass, sedge, and litter) 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 1 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 Community 4) are generally considered to be in poor hydrologic condition as the majority of plant cover is from shallow-rooted species such as Kentucky bluegrass.

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).

## Ecological Site Description—Rangeland

Wet Meadow, 10–14" MAP

MLRA: 58A – Sedimentary Plains, East  
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R058AE009MT, R060BE587MT

**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): 1  
BLM–Soil & Vegetation Inventory Method (SVIM) Data: 3  
NRCS–Range Condition Record (ECS-2): 10  
NRCS–Range/Soil Correlation Observations & Soil 232 notes: 5

**Relationship to other classification systems:**

Classification and Management of Montana’s Riparian & Wetland Sites:  
*Carex utriculata* (beaked sedge) Habitat Type

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

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

**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

Wet Meadow, 10–14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
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Wet Meadow 10-14",  
Sedimentary Plains, east  
Plant Community 1  
HCPC/ PPC  
Fallon County