

## Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
 MLRA: 60B – Pierre Shale Plains, East  
 R058AE100MT, R060BE581MT

**Site Name:** Subirrigated (Sb), 10–14 inches Mean Annual Precipitation (MAP)

**Site Number:** R058AE100MT, R060BE581MT

**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 terraces and high floodplain steppes, near springs or seeps, or other areas having a permanent water table close enough to the surface (typically within 3 feet) to influence plant composition and production. These areas are rarely or non-flooded. Rare flooding indicates that flooding is unlikely, but possible under unusual weather conditions (0–5% chance in any year). These are also considered to be “lentic” (standing water) riparian/wetland areas.

**Elevation (feet):** 1,900–3,500

**Landform:** terrace, hillslope (when near spring or seep), floodplain steppes

**Slope (percent):** 0–2, except can be greater when this site occurs on hillslope near a spring/seep

**Depth to Water Table (inches):** mainly about 36

**Flooding:** none to rare

**Ponding:** none

**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:

WETLAND DESCRIPTION:	<u>SYSTEM</u>	<u>SUBSYSTEM</u>	<u>CLASS</u>
(Cowardin System)	Palustrine	N/A	Emergent

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

## Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT

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

The Wet Meadow site differs mainly by being wet to at or near the surface for most of the growing season.

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 Subirrigated 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 non-hydric. The soils associated with this ecological site are mainly deep to very deep with a permanent water table within about three feet of the surface. They are generally in the aquic moisture regime or aquic intergrade.

**Parent material (kind):** alluvium

**Parent material (origin):** mixed

**Surface textures:** will vary, mainly loam, sandy loam, clay loam

**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 36" of the surface

**Drainage Class:** somewhat poorly

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

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

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

**6a. Representative Soils:** Listed below are soils and map units which characterize this site in various counties. (Reference MT-165, Soil Interpretive Rating Report.) However, a soil map unit representing this ecological site does not exist for all counties. 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. On site investigation is usually necessary to verify that the symbol represents this ecological site.

COUNTIES	TYPICAL SOILS	MAP UNIT
Custer	Bigsandy loam	77A
Custer	Lallie silty clay	473A
Garfield	Bigsandy loam	942A
Prairie	Aeric fluvaquents	4

**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 grasses, sedges, and rushes with forbs occurring in smaller percentages. A few woody species, such as willows may be present. Approximately 60% of the annual production by weight is from grasses, 30% is from sedges and rushes, 10% is from forbs, and a trace amount may be from shrubs. Generally, willows that are present are mature plants, with very little reproduction except vegetatively (i.e., root sprouting).

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>.

# Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT

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

Common Name	Plant Symbol	Plant Group	Percent Comp.	Group Max. %	Mean Annual Precipitation (inches)				
					10	11	12	13	14
					(lbs./acre)	(lbs./acre)	(lbs./acre)	(lbs./acre)	(lbs./acre)
<b>Grasses, Sedges, and Rushes 75–85%</b>					<b>2550</b>	<b>2975</b>	<b>3400</b>	<b>3825</b>	<b>4250</b>
Prairie cordgrass	SPPE	5	15-25		450-750	525-875	600-1000	675-1125	750-1250
Switchgrass	PAVI2	5	5-15		150-450	175-525	200-600	225-675	250-750
Slender or Bearded wheatgrass	ELTRT ELTRS	2	1-10	10	30-300	35-350	40-400	45-450	50-500
Bluejoint reedgrass	CACA4	6	5-15		150-450	175-525	200-600	225-675	250-750
Slimstem reedgrass	CANE	6	5-10		150-300	175-350	200-400	225-450	250-500
Big bluestem	ANGE	1	5-10		150-300	175-350	200-400	225-450	250-500
Tufted hairgrass	DECE	2	1-5		30-150	35-175	40-200	45-225	50-250
Fowl mannagrass	GLST	2	1-5		30-150	35-175	40-200	45-225	50-250
Western wheatgrass	PASM	14	0-5}						
Mat muhly	MURI	16	1-5}	5	30-150	35-175	40-200	45-225	50-250
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
Nebraska sedge	CANE2	6	5-15		150-450	175-525	200-600	225-675	250-750
Clustered field sedge	CAPR5	16	1-5		30-150	35-175	40-200	45-225	50-250
Woolly sedge	CALA3	6	5-10		150-300	175-350	200-400	225-450	250-500
Brevior sedge	CABR1	2	1-5		30-150	35-175	40-200	45-225	50-250
Other sedges	CAREX		0-5		0-150	0-175	0-200	0-225	0-250
Baltic rush	JUBA	14	1-5		30-150	35-175	40-200	45-225	50-250
Slender rush	JUTE	2	0-5		0-150	0-175	0-200	0-225	0-250
Torrey's rush	JUTO	6	0-5		0-150	0-175	0-200	0-225	0-250
Tuberous rush	JUNO2	6	0-5		0-150	0-175	0-200	0-225	0-250
Other rushes	JUNCU		0-5		0-150	0-175	0-200	0-225	0-250
<b>Forbs 5–10%</b>					<b>300</b>	<b>350</b>	<b>400</b>	<b>450</b>	<b>500</b>
Field mint	MEAR4	23	1-5}						
Northwest cinquefoil	POGR9	24	1-5}						
Goldenpea	THMO	20	0-5}						
Blue lettuce	LATA	19	0-5}	10	30-150, no more than 300 for this group	35-175, no more than 350 for this group	40-200, no more than 400 for this group	45-225, no more than 450 for this group	50-250, no more than 500 for this group
Leafy aster	ASFO	23	1-5}						
Goldenrod spp.	SOLID	23	1-5}						
Silverweed cinquefoil	POAN5	20	1-5}						
Horsemint	MOFI	24	1-5}						
American licorice	GLLE3	19	1-5}						
Other native forbs	2FP		0-5}						
<b>Shrubs 0–5%</b>					<b>150</b>	<b>175</b>	<b>200</b>	<b>225</b>	<b>250</b>
Snowberry	SYAL	37	0-5}						
Willows *	SALIX		0-5}	5	0-150	0-175	0-200	0-225	0-250
Rose spp.	ROSA5	38	0-5}						
Other native shrubs	2SB		0-5}						
<b>Total Annual Production: (lbs./acre)</b>					<b>3000</b>	<b>3500</b>	<b>4000</b>	<b>4500</b>	<b>5000</b>

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

**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.

## Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT

**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	35 – 40	55 – 70	24
Forbs	1 – 3	1 – 5	12
Shrubs	0 – T	0 – T	24
Litter	50 – 55		
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 resilient to disturbance as it has essentially no limitations for plant growth, except for the 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 results in a departure from the HCPC, with a decrease of the taller, more palatable species such as **prairie cordgrass, switchgrass, fowl mannagrass, big bluestem, bluejoint and slimstem reedgrass, and Nebraska, woolly, and brevior sedges** will occur. These plants will be replaced by a mixture of medium and short grasses, sedges, and rushes including **western wheatgrass, meadow barley, mat muhly, clustered field sedge, and Baltic rush** as well as several species of non-palatable forbs. Shrubs such as **rose and snowberry** may also occasionally increase in some situations.

Continued deterioration results in an abundance of short grasses and short sedges, non-native grasses and forbs, and annuals. A lowering of the water table can also cause a significant change in the plant community. Plants that are not a part of the Historic Climax Plant Community that are most likely to invade are **Kentucky, fowl, and Canada bluegrass, smooth brome, redtop, Canada thistle, dandelion, leafy spurge, sulfur cinquefoil, annuals**, and other weedy species. **Purple loosteirife** is potentially a serious invader on this site.

Long-term non-use (>3 years) combined with the absence of fire will result in excessive litter and decadent plants.

## Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT

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

**Plant Community 1: Tall and Medium Grasses and Sedges:** 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 grasses and sedges (**prairie cordgrass, switchgrass, fowl mannagrass, big bluestem, bluejoint reedgrass, slimstem reedgrass, Nebraska sedge, brevior sedge, and woolly sedge**), and short grasses, sedges, and rushes (**mat muhly, meadow barley, clustered field sedge, 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 diversity in plant species allows for drought tolerance. 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. The presence of available water throughout the growing season provides a very favorable soil-water-plant relationship. This plant community provides for soil stability and a functioning hydrologic cycle.

**Plant Community 2: Medium Grasses, Sedges, and Rushes/ Forbs:** With slight disturbances to the site, the HCPC/PPC will tend to change to a community dominated by medium grasses, sedges, rushes and forbs, such as **slimstem reedgrass, tufted hairgrass, smallwing sedge, clustered field sedge, Baltic rush, western wheatgrass, mat muhly, and silverweed cinquefoil**. Most of the taller, more palatable grasses and sedges (prairie cordgrass, fowl mannagrass, bluejoint reedgrass, Nebraska sedge) 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 grasses and sedges 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: Medium and Short Grasses, Sedges & Rushes/ Shrubs:** With continued heavy disturbance to the site, it will become dominated by medium and short grasses, sedges, and rushes such as **western wheatgrass, mat muhly, meadow barley, clustered field sedge, and Baltic rush**. Most of the taller, more palatable grasses and sedges (prairie cordgrass, switchgrass, fowl mannagrass, big bluestem, bluejoint reedgrass, slimstem reedgrass, Nebraska sedge, brevior sedge, and woolly sedge) will occur only occasionally. There may be an increase in the amount of **rose, snowberry**, or other shrubs. Palatable and nutritious forbs will be replaced by less desirable and more aggressive species.

**Plant Community 4: Rushes, Short Grasses & Sedges/ Non-native Grasses & Forbs:** Continued heavy disturbance to the site generally results in a community comprised mainly of short, less palatable grasses, sedges, and rushes such as **Baltic rush, western wheatgrass, mat muhly, meadow barley, and clustered field sedge**. Non-native species, such as **Kentucky, fowl, or Canada bluegrass, smooth brome, redtop, Canada thistle, and dandelion** become more abundant, especially if the water table has lowered. The taller grasses and sedges will occur only occasionally. **Foxtail barley** is a common invader on this site. Palatable forbs will be mostly absent. Shrubs will continue to be common if present in one of the previous communities.

This plant community 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 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.

## Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT

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.

This site is often seeded to introduced species for hay or pasture because of its productivity potential and level landscape. Reed canarygrass and “Garrison” creeping foxtail, often along with a legume such as clover or alfalfa, are common components. This plant community is often as productive as the HCPC but is no longer managed as rangeland. This community can respond positively to improved grazing management but it will take additional inputs (reseeding) to move it towards a community similar in production and composition to that of Plant Community 1 or 2.

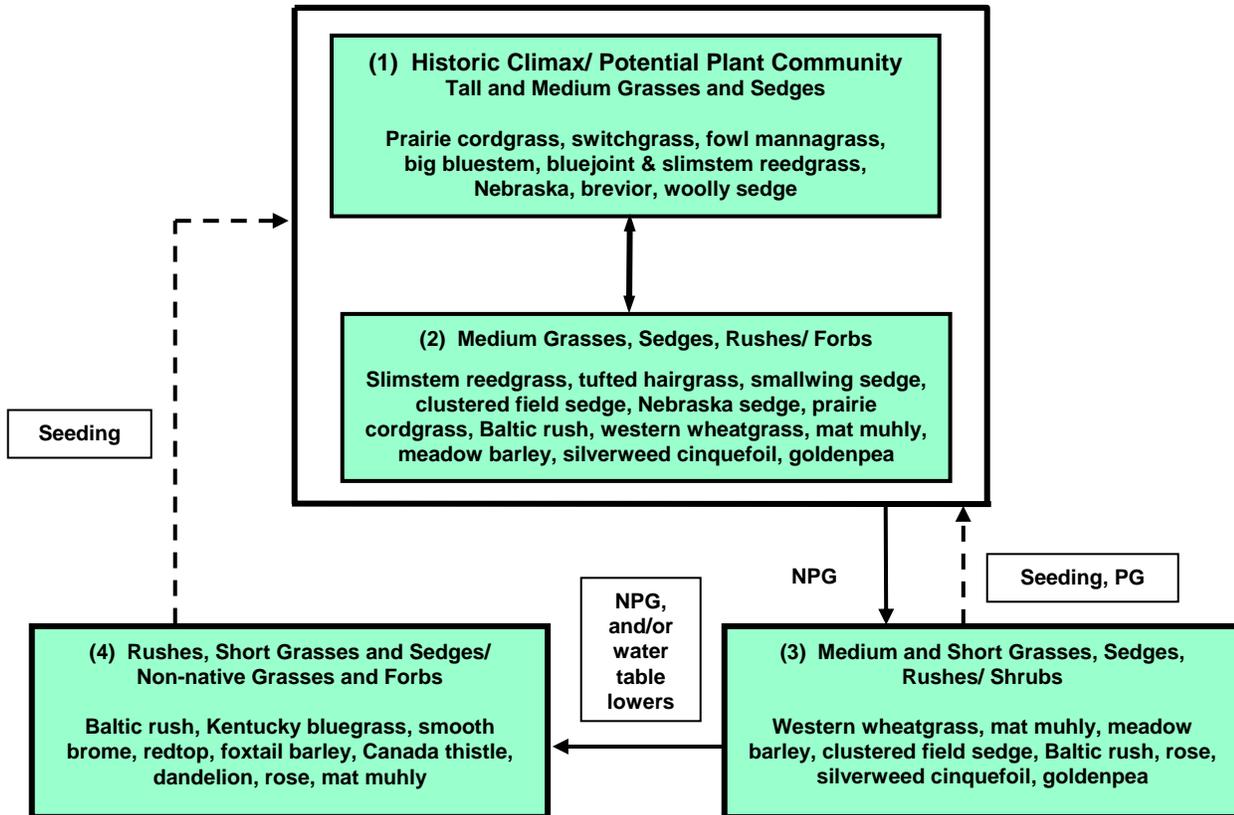
**10b. Plant Communities and Transitional Pathways (State and Transition Model):** Transitions in plant community composition occur along a gradient that is not linear. Many processes are involved in the changes from one community to another. Changes in climate, elevation, soils, landform, fire patterns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

# Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT

## 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.

# Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT

**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 Subirrigated 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 feature of this site. The hummocking can be exacerbated if grazing impact becomes excessive.

Whenever Plant Community 2 (medium and short 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 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 the presence of non-native grasses and undesirable plants will make it 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, smooth brome, and Canada thistle are stable and 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.

## Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT

**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.

# Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT

## 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 &amp; Sedges (HCPC/PPC)</b>  <i>Prairie cordgrass, switchgrass, fowl mannagrass, reedgrasses, Nebraska sedge</i>  (S.I. >70%)	13-14"	4500-5000+	3800-4200+	1.2 – 1.4+	.75 – .85	3800-4200+	1.2-1.4+	.75 – .85
	10-12"	3000-4000+	2500-3400+	.80 – 1.1+	.90 – 1.25	2500-3400+	.80-1.1+	.90 – 1.25
<b>2. Medium Grasses, Sedges &amp; Rushes/ Forbs</b>  <i>Slimstem reedgrass, tufted hairgrass, smallwing sedge, clustered field sedge, Nebraska sedge, prairie cordgrass, goldenpea</i>  (S.I. 45-70%)	13-14"	3600 - 4000	2900-3200	.92 – 1.0	1.0 – 1.1	3100-3400	.98-1.1	.91 – 1.0
	10-12"	2400 - 3200	1900-2600	.60 – .82	1.2 – 1.7	2000-2700	.63-.85	1.2 – 1.6
<b>3. Medium &amp; Short Grasses, Sedges &amp; Rushes/ Shrubs</b>  <i>Western wheatgrass, mat muhly, meadow barley, clustered field sedge, Baltic rush, rose, goldenpea</i>  (S.I. 25-45 %)	10-14"	2100 - 3500	1700-2800	.54 – .89	1.1 – 1.8	1800-3000	.57-.95	1.1 – 1.75
<b>4. Rushes, Short Grasses &amp; Sedges/ Non-native Grasses &amp; Forbs</b>  <i>Baltic rush, Kentucky bluegrass, foxtail barley, Canada thistle</i>  (S.I. < 20%)	10-14"	1500-2500	900-1500	.20 – .33	3.0 – 5.0	1050-1750	.23-.39	2.6 – 4.3

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.

# Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT

## 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 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
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
Big bluestem	P	P	P	P	P	P	P	P
Other grasses	D	D	D	D	D	D	D	D
Nebraska sedge	P	P	P	P	D	P	P	P
Clustered field sedge	D	D	D	D	D	D	D	D
Woolly sedge	D	D	D	D	U	D	U	U
Brevior sedge	D	D	D	D	D	D	D	D
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
Goldenrod spp.	N	U	U	N	N	D	U	N
Silverweed cinquefoil	N	N	N	N	N	D	D	N
Horsemint	N	U	U	N	U	D	D	U
American licorice	U	U	U	U	D	D	D	D
Other native forbs	N	N	N	N	U	U	U	U
Snowberry	D	D	D	D	D	D	D	P
Willows	D	D	D	P	D	D	P	P
Rose	U	D	D	U	D	D	D	D
Other native shrubs	N	N	N	N	U	U	U	U

\* Common non-native species

## Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT

**13. Wildlife Interpretations:** The subirrigated ecological site is important for enhancing biodiversity within an otherwise semi-arid environment. Although surface water is rarely present, the high water table allows growth of tall herbaceous and woody plants which provide habitat structure, food and cover for diverse wildlife species. The Historic Climax Plant Community was used historically by large herds of grazing ungulates, migrating shorebirds and waterfowl, flocks of sage grouse and many song bird species. Uncontrolled livestock grazing has greatly simplified this plant community in many areas. Livestock are attracted to the subirrigated site because of the availability of palatable, succulent forage when upland vegetation is dry. Invasive plants, including Canada thistle, Kentucky bluegrass, redtop, and dandelion compete with native vegetation and degrade habitat for many wildlife species. Prescribed grazing strategies can maintain healthy wildlife habitat and promote vegetative productivity on this site. The proximity of uplands, subirrigated sites, riparian habitat and open water creates an exceptionally diverse habitat complex for a wide variety of wildlife.

**Plant Community 1: Tall and Medium Grasses and Sedges (HCPC or PPC):** The mesic environment and abundance of forbs support diverse insect and invertebrate populations ranging from grasshoppers and spiders to dragonflies and pollinating bees. Amphibians, such as Woodhouse's toad, and reptiles, such as garter snakes, rely on this community for migration and over-wintering habitat. Amphibians can be considered a "keystone species" because of their value as indicators of environmental degradation. The HCPC supports a diverse bird population because of the mix of tall and medium grasses and sedges and abundant forbs. Northern harriers hunt over, and nest in, this community. Shorebirds such as the common snipe and upland sandpiper nest here. LeConte's sparrow and the savanna sparrow are examples of song bird species using this plant community. Sage grouse broods find abundant insect foods here and adults select succulent forbs. The predominance of grasses and sedges in the HCPC favors grazers and mixed feeders like bison, elk and pronghorn. Thermal and escape cover are limited because of the low shrub coverage. Small mammals, such as the meadow vole, are common and abundant.

**Plant Community 2: Medium Grasses, Sedges & Rushes/ Forbs:** Loss of tall grasses and sedges along with a change in the forb component represents a decrease in habitat structural diversity. Insect populations may still be abundant but are less diverse. Amphibian habitat is degraded by a reduction in surface litter and moisture. Breeding bird populations are less diverse as habitat structure is simplified. Common snipes will still use this community for nesting and feeding. Sage grouse broods continue to select this habitat for critical insect foods during their fast growth period follow hatching. Small mammal populations may shift away from dominance by voles to seed-eaters like deer mice as ground cover decreases. Forage value for big game declines with the loss of a diverse mix of warm and cool season grasses.

**Plant Community 3: Medium & Short Grasses, Sedges & Rushes/ Shrubs:** Insect populations decline in abundance and diversity with the loss of succulent forbs and increase in invasive weeds. Amphibians are negatively affected by a further loss of litter cover and drier ground surface. Bird species diversity declines as habitat structural complexity is lost. Some species characteristic of drier habitats may increase.

**Plant Community 4: Rushes, Short Grasses & Sedges/ Non-native Grasses & 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. Ungulate species will still find palatable forage (i.e. Kentucky bluegrass) but the forage diversity and length of green feed period have declined significantly. Big game cover value is almost non-existent and forage value is limited and shorter in duration.

# Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT

**Introduced Species:** Tall, productive pasture grasses and alfalfa or clover provide excellent habitat for some wildlife species, although wildlife habitat diversity is lower as compared to the HCPC or PPC. When forbs are included in the mixture, insect populations may be abundant and diverse. Amphibians, such as Woodhouse’s toad, may thrive although species diversity is probably lower compared to the HCPC because plant species and structural diversity is also lower. Some breeding birds, such as the bobolink, prefer tall, introduced grasses. Savanna sparrow are common and northern harriers and short-eared owls commonly hunt this habitat. Deer, elk and pronghorn seek out productive pasture and hayland. In fact wildlife use may be a problem for ranchers needing abundant forage and hay. Meadow voles are a common small mammal in this community.

### 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
Goldenrod spp.	D	P	P	D	D	D	D	D
Silverweed cinquefoil	U	U	U	U	U	U	U	U
Horsemint	U	U	U	U	N	U	N	N
American licorice	D	P	D	D	D	P	D	D
Other native forbs	D	D	D	D	D	D	D	D
Snowberry	P	P	P	P	P	P	P	P
Willows	D,U	D,U	D,U	D,U	P,D	P,D	P,D	P,D
Woods rose	P	P	P	P	P	P	P	P
Other native shrubs	U	U	U	U	D	D	D	D

**14. Hydrology Data:** The runoff potential for this site is low. Runoff curve numbers generally range from 61 to 79. The soils associated with this ecological site are generally in Hydrologic Soil Group B. 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 drought tolerant species (often non-native).

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%.

# Ecological Site Description—Rangeland

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT

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 3 and 4) are generally considered to be in poor hydrologic condition as the majority of plant cover is from shallow-rooted species such as 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).

**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:  
*Spartina pectinata* (prairie cordgrass) Habitat Type

**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

Subirrigated, 10-14" MAP

MLRA: 58A – Sedimentary Plains, East  
MLRA: 60B – Pierre Shale Plains, East  
R058AE100MT, R060BE581MT



Subirrigated 10-14",  
Sedimentary Plains, east  
Plant Community 1  
HCPC /PPC  
Prairie County



Subirrigated 10-14",  
Sedimentary Plains, east  
Plant Community 1  
HCPC /PPC



Subirrigated 10-14",  
Sedimentary Plains, east  
Plant Community 1  
HCPC /PPC