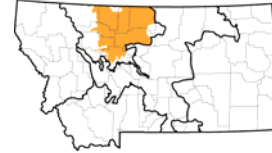


UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ECOLOGICAL SITE DESCRIPTION

ECOLOGICAL SITE CHARACTERISTICS



Site Type: Rangeland

Site Name: Silty 10 to 14 inch p.z. (precipitation zone)

Site ID: R052XN161MT

Major Land Resource Area: 52XN - Northern Glaciated Plains

Physiographic Features: This site usually occurs on till plains, but is also found on alluvial fans, and knolls. Slopes vary from 1-15%, but are usually less than 8%. Elevations generally range from 2,000 to 3,500 feet.

Land Forms:

- (1) Hill
- (2) Till Plain
- (3) Alluvial Fan

	<u>Minimum</u>	<u>Maximum</u>
<u>Elevation (feet):</u>	1875	3800
<u>Slope (percent):</u>	1	15

Water Table Depth (inches):

Flooding:

Frequency:	None to rare
Duration:	Brief to none

Ponding:

Depth (inches):	NA
Frequency:	None
Duration:	None

Runoff Class: Very low to medium

Aspect: No significant influence

Climatic Features

A semi-arid, temperate climate characterizes the Glaciated Plains. The predominance of cool season species has evolved to take advantage of the precipitation regime that peaks in late spring-early summer (June). Seventy-five percent of the annual precipitation usually falls as steady, soaking, frontal system rains. Summer rains usually come with thunderstorms. Precipitation is the most important factor influencing production (Heitschmidt et al 2005). Severe drought occurs on average in two out of every ten years (Cooper, et al., 2001).

	<u>Minimum</u>	<u>Maximum</u>
<u>Frost-free period (days):</u> >32F, 90% Probability = Minimum 50% Probability = Maximum	85	123
<u>Freeze-free period (days):</u> >28F, 90% Probability = Minimum 50% Probability = Maximum	116	142
<u>Mean annual precipitation (inches):</u>	10	14

Climate Stations:

- (1) #241088 - Breddete
- (2) #241692 - Chester
- (3) #243558 - Glasgow Airport
- (4) #243996 - Havre WSO AP
- (5) #245572 - Medicine Lake
- (6) #247500 - Shelby

Influencing Water Features

This site is not influenced by water from wetlands or streams.

Representative Soil Features

These soils formed from glacial till. The surface layer of these soils varies from 0-7 inches in depth and are typically loam, silt loam, gravelly loam, clay loam, silty clay loam or sandy clay loam. Underlying layers are often clay loams, loams or silty clay loams. Soils are well drained, and are more than 20 inches deep to bedrock. Permeability varies from very slow to slow. Soil ph varies from 6.1-8.4.

Predominant Parent Materials:

Kind: glacial till

Origin: recent alluvium

Surface Texture: (1) loam
(2) silt loam
(3) clay loam

Surface Texture Modifier: (1) None

Subsurface Texture Group:

Surface Fragments <= 3" (% cover): 0

Surface Fragments >3" (% cover): T - 1

Subsurface Fragments <= 3" (% Volume): 4 - 11

Subsurface Fragments > 3" (% Volume): 2 - 5

Drainage Class: Well

Permeability Class: Moderate to Moderately Slow

	<u>Minimum</u>	<u>Maximum</u>
<u>Depth (inches):</u>	20	> 72
<u>Electrical Conductivity (mmhos/cm):</u>	0	2
<u>Sodium Adsorption Ratio:</u>	---	---
<u>Calcium Carbonate Equivalent (percent):</u>	---	---
<u>Soil Reaction (1:1 Water):</u>	6.1	8.4
<u>Soil Reaction (0.1M CaCl₂):</u>	---	---
<u>Available Water Capacity (inches):</u>	5	7

Plant Communities

Ecological Dynamics of the Site

This ecological site developed through time under the influence of climate, geological parent material, fire, plants and animals. Research consistently shows that precipitation is the principal factor altering productivity on ecological sites in the Northern Great Plains (Heitschmidt et al. 2005). The same authors concluded that grazing reduces herbage standing crop, whereas its effects on above ground net primary production varies with timing of grazing and precipitation events, along with the functional and structural composition of the plant community.

It is theorized that these lands burned on a natural interval of 5-7 years (Frost 1998). Fires were ignited by lightning and by Early Americans whom were attempting to manipulate the environment.

The resultant historic climax plant community (HCPC) is the basis for plant community interpretations. The HCPC was determined by evaluating rangeland relic areas, and other areas protected from excessive disturbance. The HCPC is comprised of a mixture of cool and warm season grasses, forbs and shrubs. About 85% of the annual production is from grasses and sedges, most of which is produced during the cool season. Forbs and shrubs contribute 10% and 5%, respectively, to total annual production. Total vegetative production averages 1600 lbs/ac during normal years.

This site is resistant and resilient to disturbance. Departures in the HCPC are brought about by management actions, drought, a change in the natural fire regime, colonization and recruitment of noxious weeds, etc. The integrity of the site can be readily damaged with the continued absence of prescribed grazing and during prolonged drought. As the HCPC regresses to lower seral stages, the deep-rooted perennial grasses are replaced by blue grama, sandberg bluegrass, fringed sagewort, hood's phlox, threadleaf sedge, hairy goldenaster, and dense clubmoss. The dominance of these "lower-successional" species in the plant community disrupts ecological processes, impairs the biotic integrity of the site, and restricts the system's ability to recover to higher seral states. The potential of succession back to the HCPC varies with the interaction of all environmental factors.

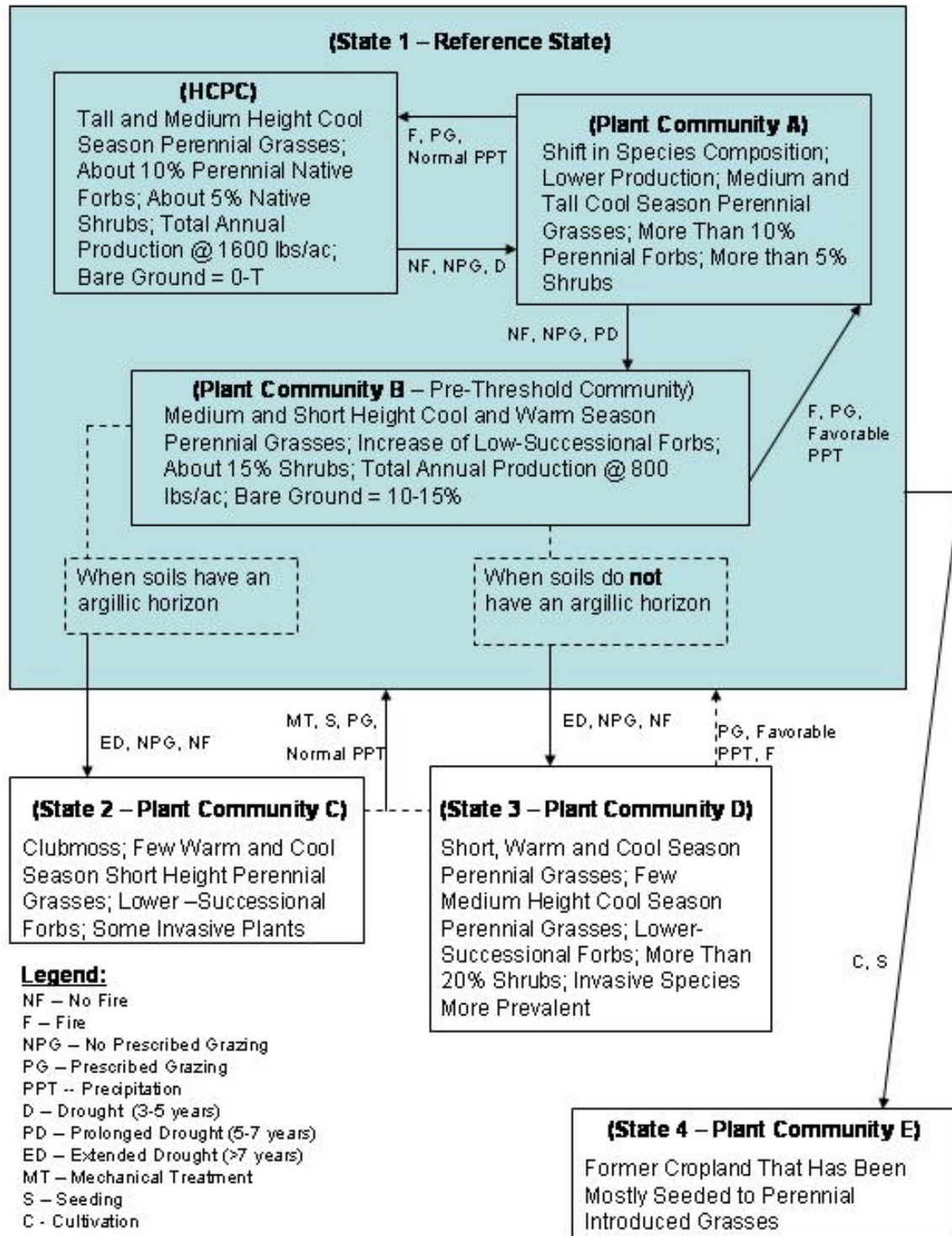
State and Transition Diagram

Trends in plant community dynamics, states, transitional pathways and thresholds have been evaluated and determined through experience and

research. Successional pathways of the Silty 10-14" p.z. ecological site cannot be satisfactorily described using traditional theories of plant succession leading to a single climax community (Briske et al. 2005). As the HCPC regresses to an early seral state, it is theorized that a threshold is crossed somewhere within the mid-seral state. Plant communities occurring below this threshold are in a steady state. Succession back to the HCPC does not occur within a reasonable length of time, and/or without a large input of energy.

Three plant communities and the successional and regressional pathways that commonly occur within the Reference State (State #1) are shown in the following diagram. In addition, the transitions from Plant Community B (State #1) to State #2 (Plant Community C) and State #3 (Plant Community D) are also illustrated. A third transition denotes the pathway from State #1 to an introduced perennial grass seeding (State #4). Ecological processes are discussed in the plant community descriptions, which follow the diagram.

Silty 10-14" p.z. RRUs 52XC, 52XN, 53AE



State #1: Historic Climax Plant Community (HCPC)

The interpretive plant community for this site is the Historic Climax Plant Community (HCPC). Cool season tall and mid-grasses (such as green needlegrass, western wheatgrass, thickspike wheatgrass, porcupine grass and needleandthread grass) dominate the HCPC. These cool season grasses represent about 75% of the total annual plant production in the community. Bluebunch wheatgrass is often the dominant species on the Silty 10-14" p.z. site in the northern Glaciated Plains.

Prairie junegrass, upland sedges and plains reedgrass (cool season species) and blue grama (a warm season species) also occur in the HCPC. Dotted gayfeather, scurfpeas, prairie clovers and other forbs make up less than 10% of the annual production. American vetch, groundplum milkvetch, purple and white prairie clover and scurfpea are important because of their ecological role in the nitrogen cycle.

Winterfat is the most prevalent shrub and is also a valuable forage plant for wildlife and livestock forage, but it seldom produces more than 80 lbs/ac in any community. Silver sagebrush and western snowberry commonly occur in the lower landscape positions of this site. They have some value for wildlife but tend to be restricted to lower landscapes that may benefit from rare flooding and livestock forage. Overall, shrubs account for about 5% of the annual plant production.

Range inventory data collected (in 2001 and 2004) on the Fort Peck and Fort Belknap Indian Reservations indicate total above ground production varies from 1,270 to 2,550 lbs/ac. The scheduling of the inventories coincided with favorable precipitation cycles. Therefore, it is recommended that Thus, total annual production averages 1600 lbs/ac during normal years. Production varies from 1100 lbs/ac in unfavorable years to 2000 lbs/ac during favorable years. Average annual production is expected to increase and decrease, respectively on more mesic and xeric portions of the Glaciated plains. Similarity indices (SI) greater than 75% were recorded within the HCPC.

This plant community is well adapted to the glaciated plains. Precipitation is the most important factor influencing production (Heitschmidt et al 2005). The functional and structural diversity of plant species (annuals, perennials, cool and warm season grasses, forbs and shrubs) optimize the capture of solar energy and maximize subsequent plant growth through the efficient use of available soil water and nutrient cycling. Following a prolonged disturbance which reduces the competitiveness of tall bunchgrasses, production of rhizomatous mid-grasses and short grasses increase. When disturbances are sustained for a prolonged period, woolly plantain, annual bromes or other annual species may invade a community. With proper grazing management and normal precipitation, these invader species normally do not persist for more than a few years.

Litter covers about 60% of the soil surface. Bare ground varies from 0 to Trace. Rills should not be present and water flow patterns should be barely observable. Runoff and soil erosion increase as the HCPC regresses to earlier seral states.

(Insert HCPC Plant Community photo)

The major plant species composition and production by dry weight are shown for the HCPC in the following table. Total annual production has been derived from several sources, and has been adjusted to represent a typical annual precipitation cycle.

Historic Climax Plant Community Plant Species Composition:

GRASSES /GRASSLIKE

85% of Community

<u>Common Name</u>	<u>Scientific Name</u>	<u>Group</u>	<u>Group Allowable</u>		<u>Annual Production in</u>	
			<u>Pounds Per Acre</u>		<u>Pounds Per Acre</u>	
			<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
Little bluestem	<i>Schizachyrium scoparium</i>				0	80
Green needlegrass	<i>Nassella viridula</i>	1	160	400	80	200
Porcupine grass	<i>Hesperostipa spartea</i>	1			80	200
Bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>				200	800
Western wheatgrass	<i>Pascopyrum smithii</i>	1	160	400	80	200
Thickspike wheatgrass	<i>Elymus macrourus</i>	1			80	200
Sideoats grama	<i>Bouteloua cuetipendula</i>				0	80
Needle and thread	<i>Hesperostipa comata</i>				80	240
Threadleaf sedge*	<i>Carex filifolia</i> *				16	80
Sandberg bluegrass*	<i>Poa secunda</i> *				16	80
Prairie junegrass*	<i>Koeleria macrantha</i> *					
Blue grama*	<i>Bouteloua gracilis</i> *					
Plains reedgrass*	<i>Calamagrostis montanensis</i> *			* 160 lbs/ac is max	16	80
Other native grasses*				for all species in this group; no more than 80 lbs/ac for any one species.	16	80

FORBS

10% of Community

<u>Common Name</u>	<u>Scientific Name</u>	<u>Group</u>	<u>Group Allowable</u>		<u>Annual Production in</u>	
			<u>Pounds Per Acre</u>		<u>Pounds Per Acre</u>	
			<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
American vetch	<i>Vicia americana</i>				16	80
Dotted gayfeather	<i>Liatris punctata</i>				16	80
Purple prairie clover	<i>Dalea purpurea</i>	3	32	160	16	80
White prairie clover	<i>Dalea candida</i>	3			16	80
Missouri goldenrod*	<i>Slidago missouriensis</i> *			No more than 160	16	80
Western yarrow*	<i>Achillea millefolium</i> *			lbs/ac total for all	16	80
Aster*	<i>Aster spp.</i> *			Forbs.	16	80
Scarlet globemallow*	<i>Sphaeralcea coccinea</i> *				16	80
Prairie thermopsis*	<i>Thermopsis rhombifolia</i> *			*No more than 90	16	80
Scurpea*	<i>Psoraleidum spp.</i> *			lbs/ac for all species	16	80
Hairy goldenaster*	<i>Heterotheca villosa</i> *			in this group; No	16	80
Hoods phlox*	<i>Phlox hoodii</i> *			more than 25 lbs/ac	16	80
Dense clummos	<i>Selaginella densa</i>			for any one species.	0	T
Other Native Forbs*					16	80

SHRUBS AND HALF-SHRUBS

5% of Community

<u>Common Name</u>	<u>Scientific Name</u>	<u>Group</u>	<u>Group Allowable</u>		<u>Annual Production in</u>	
			<u>Pounds Per Acre</u>		<u>Pounds Per Acre</u>	
			<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>

		<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
Winterfat	<i>Krascheninnikovia lanata</i>			16	80
Rubber rabbitbrush*	<i>Ericameria nauseosa</i> *	No more than 80 lb/ac		10	80
Silver sagebrush*	<i>Artemisia cana</i> *	total for all shrubs.		10	80
Snowberry*	<i>Symphoricarpos spp.</i> *			10	80
Fringed sagewort*	<i>Artemisia frigida</i> *	*No more than 70		10	80
Rose*	<i>Rosa spp.</i> *	lbs/ac for all species in		10	80
Plains pricklypear	<i>Opuntia polyacantha</i>	this group; No more		0	T
Other native shrubs*		than 20 lbs/ac for any		0	80
		one species.			

Structure and Cover

Soil Surface Cover (%)

Basal Cover				Non-Vascular Plants	Biological Crust	Litter	Surface Fragments >1/4 & <= 3"	Surface Fragments > 3"	Bedrock	Water	Bare Ground
Grass/ Grasslike	Forb	Shrub/ Vine	Tree								
30	1-5	1-3	0								

Ground Cover (%)

Vegetative Cover						Non-Vegetative Cover					
Grass/ Grasslike	Forb	Shrub/ Vine	Tree	Non-Vascular Plants	Biological Crust	Litter	Surface Fragments >1/4 & <= 3"	Surface Fragments > 3"	Bedrock	Water	Bare Ground
				0-5	0-2	60	0-3	0-2	0	T	0-T

Structure of Canopy Cover (%)

	Grass/Grasslike	Forb	Shrub/Vine	Tree
<= 0.5 feet	10	40	20	0
>0.5 - <=1 feet	30	50	40	0
>1 - <=2 feet	40	8	30	0
>2 - <=4.5 feet	20	2	10	0
>4.5 - <=13 feet	0	0	0	0

Annual Production by Plant Type:

Plant Type	Annual Production (lbs/AC)		
	Low	RV*	High
Grasses/Grasslike	935	1360	1700
Forb	110	160	200
Shrub/Vine	55	80	100
Tree	0	0	0
Total	1100	1600	2000

*RV means "representative value".

***Successional pathway from HCPC to Community A (State #1):**

Transition pathways from the HCPC are influenced by non-prescribed grazing, drought, cessation of the natural fire regime, colonization and recruitment of noxious weeds, etc. These are shown in the state-and-transition diagram.

Plant Community A (State #1):

Total production averages about 1300 lbs/ac for this community, about 80% of the production in the HCPC. Vigor and production of the tall cool season bunchgrasses (bluebunch wheatgrass, green needlegrass, porcupine grass) is reduced. Production of the rhizomatous midgrasses (western and thickspike wheatgrass) and the short cool (prairie junegrass, sandberg bluegrass) and warm (blue grama) increase. Production of needleandthread also increases as it tends to replace green needlegrass, especially on soils with less moisture holding capacity.

Exact response by the lower successional species (blue grama, threadleaf sedge, sandberg bluegrass, fringed sagewort, silver sage brush, etc.) vary with the kind of disturbance (drought, cattle, etc.) and with precipitation (amount and timing).

SI indices from 55-75% are associated with Plant Community A. In contrast to the HCPC, range conservationists have slight concerns regarding lower infiltration rates and potentially higher runoff rates, plant functional/structural group shifts, decreasing amount of litter, and increased presence of invasive plants.

(Insert Plant Community A photo)

***Succession from Plant Community A to HCPC:**

Plant Community A is resilient. Successional processes can readily return this community to the HCPC. Succession is facilitated by prescribed grazing and the incorporation of the natural fire regime. This process can occur during periods of normal precipitation.

***Transitional Pathway from Plant Community A to Community B (State #1):**

Non-prescribed grazing, drought, colonization and recruitment of noxious weeds, and the continued absence of the natural fire regime will result in regression to Plant Community B.

Plant Community B (State #1):

Plant Community B is dominated by medium and short height cool and warm season perennial grasses. Production of western wheatgrass, thickspike wheatgrass and needleandthread (medium height grasses) is similar (from 300-400 lbs/ac) to total production of the short grasses and sedges (blue grama, prairie junegrass, sandberg bluegrass, threadleaf sedge, and plains reedgrass). Remnants of bluebunch wheatgrass and green needlegrass remain in communities within northern portions of the Glaciated Plains. These desirable bunchgrasses usually produce from 100-200 lbs/ac in this Plant Community.

Production of hairy goldenaster, scarlet globemallow, scurfpeas, hoods phlox, western yarrow and other lower-successional forbs increases relative to the production of the prairie clovers and American vetch. Production of lower successional forbs, fringed sagewort (half-shrub) and the native shrubs averages 320 lbs/ac. During the 2002-2004 range inventories conducted on the Fort Peck and Belknap Reservations, Similarity indices (SI) for this community varied from 25-55%.

Total forage production averages about 800 lbs/acre, a 50% decline from the high seral state. In contrast to the HCPC, range conservationists express moderate to high concerns about plant community composition, functional/structural groups, litter, annual production, and invasive plants. Although plant Community B is fairly resilient, it is not highly resistant to disturbance. It is the pre-threshold community. Therefore it is critical that this community be recognized and strategies implemented to prevent further regression. Community B can readily regress to a lower state, from which succession back to the HCPC to Plant Community A would be restricted.

(Insert Plant Community B photo)

***Succession from Plant Community B to Plant Community A:**

Successional processes can readily return Plant Community B to Plant Community A. Succession is facilitated by prescribed grazing, re-introduction of the natural fire regime, and a period of favorable precipitation.

***Transition from Plant Community B to Communities C & D (States #2 & #3):**

Plant Community B regresses to either Plant Community C (State #2) or Community D (State #3). The pathways are determined by the presence (Community C) or absence of an argillic horizon (Community D) (see the state-and-transition diagram).

Plant Community C (State #2):

Clubmoss, blue grama, sandberg bluegrass, and prairie junegrass dominate Plant Community C. At some locations, clubmoss will form a mat-like carpet over 30-70% of the ground. Although some western wheatgrass plants persist as single shoots with few seedstalks, it is difficult to find green needlegrass, bluebunch wheatgrass and other tall bunchgrasses. There are few seedlings of high-successional species emerging through the clubmoss-blue grama sod. Some researchers believe that this is due to an inadequate seedbank (Romo and Bai 2004).

Wooly plantain, hoods phlox, hairy goldenaster and scarlet globemallow are common forbs. Fringed sagewort and pricklypear cactus are usually common in

this Community. Japanese brome, cheatgrass and a few annual forbs are distributed throughout the Community, but generally contribute less than 10% of the total production.

Each of the primary processes: 1) hydrology (the capture, storage and redistribution of precipitation), 2) energy capture (conversion of sunlight to plant and animal matter), and 3) nutrient cycling (the cycle of nutrients through the physical and biotic components of the environment) has been degraded beyond the point of self-repair within a reasonable length of time. For example, when tall, high producing, cool season grasses are replaced by increasers (such as blue grama, clubmoss and prairie junegrass), the abilities of the plant community to maximize the conversion of solar energy to plant biomass and efficiently utilize available precipitation are impaired. Less solar energy is captured and converted to plant carbohydrates. Plant productivity declines, and there are fewer plants and less litter to protect the soil. As clubmoss increases, it is theorized that infiltration decreases and/or surface runoff and soil evaporation increases. Because ecological processes of the site are no longer balanced and sustained, shallow rooted, warm season species gain a competitive advantage over the deep rooted, cool season species. The biotic integrity of the site is degraded. Thus, the transition from Plant Community B (State #1) to Plant Community C (State #2) crosses a threshold. Thresholds are defined as a point in space and time at which one or more of the primary ecological processes responsible for maintaining the sustained equilibrium of the state degrades beyond the point of self-repair.

(Insert Plant Community C photo)

***Succession or Regression from Plant Community C:**

Plant Community C is a steady state. It is resistant to further disturbance, and it lacks the resiliency to return to the Reference State. Anecdotal reports indicate that succession from a clubmoss-dominated community can be facilitated with livestock impact (hoof action, urination, etc.). However, significant succession has not been documented in research studies. Therefore, it is recommended that mechanical treatment is required to return this plant community to the Reference State (State #1). Because the seedbank of high-successional species is believed to be inadequate, it may be necessary to seed desirable species following the mechanical treatment.

Plant Community D (State #3):

Plant Community D is dominated by short height cool and warm season perennial grasses (blue grama, prairie junegrass, plains reedgrass, sandberg bluegrass). A few high-successional medium and tall height perennial grasses persist in this community. Production of Japanese brome and cheatgrass accounts for 10 of total annual production. Total annual production of this community normally varies from 400-600 lbs/ac.

Hairy goldenaster, scarlet globemallow, western yarrow, aster, biscuitroot, scurfpea, wallflower and other lower-successional forbs are common. In comparison to Plant Community B, production of fringed sagewort, prickly pear cactus and broom snakeweed generally increases significantly.

The ecological concerns described for Plant Community C are also inherent in Plant Community D. Each of the primary processes: 1) hydrology (the capture, storage and redistribution of precipitation), 2) energy capture (conversion of sunlight to plant and animal matter), and 3) nutrient cycling (the cycle of nutrients through the physical and biotic components of the environment) has been degraded beyond the point of self-repair within a reasonable length of time. For example, when tall, high producing, cool season grasses are replaced by increasers (such as blue grama, clubmoss and prairie junegrass), the abilities of the plant community to maximize the conversion of solar energy to plant biomass and efficiently utilize available precipitation are impaired. Less solar energy is captured and converted to plant carbohydrates. Plant productivity declines, and there are fewer plants and less litter to protect the soil. Without the thick clubmoss cover, the potential for erosion is actually higher in this community than it is in Plant Community C.

(Insert Plant Community D photo)

***Transition from Plant Community D to the Reference State (State #1):**

Community D is fairly resistant. Further regression is unlikely with prescribed grazing and normal precipitation. As a steady state, this community is not highly resilient. Ecological concepts and perspectives suggest that succession from this Community to the Reference State #1 is not likely to occur without significant inputs (i.e., mechanical treatment). However, anecdotal information suggests that succession from Plant Community D to State #1 may occur when prescribed grazing is combined with an extended period of favorable precipitation. The rate of succession would be influenced by the presence of a high-quality seedbank.

***Transition from State #1 to Plant Community E (State #4):**

More than a million acres of former cropland in the Glaciated Plains have been seeded to introduced and native species. These seedings resulted from Society's concerns regarding land stewardship and erosion, and have been largely funded by the Federal Government. These programs spanned from the 1940s (Bankhead Jones Act) to the present (Conservation Reserve Program - CRP).

Crested wheatgrass was the primary species seeded under the direction of the Bankhead Jones Act. Crested wheatgrass, intermediate wheatgrass, smooth brome grass and some native grasses were seeded during the Soil Bank Programs of the 1960-1970 era. Both introduced and native species were seeded during the CRP program (1985-present). There are over 220,000 acres

of CRP in Valley County alone, the majority of which occur on the Silty 10-14" p.z. ecological site.

The transition of these seeded communities from State #1 is depicted in the state-and-transition model. However, their future is not predicted. Depending on subsequent government programs and agricultural prices, these lands could stay in permanent vegetation with limited haying and grazing, be used as permanent pasture, or be converted to cropland.

(Insert Plant Community E photo)

Ecological Site Interpretations

Animal Community

Livestock Management

This site evolved with grazing (bison, elk, deer and antelope, grasshoppers and jackrabbits, prairie dogs, etc.) fire and climatic extremes. The site is highly resistant to disturbances which may alter its ecological processes. It is also resilient. Following perturbations such as drought, which allows blue grama and other increasers to increase at the expense of the mid and tall grasses, succession occurs with subsequent rainfall. Total annual production averages 1600 lbs/ac during normal years.

Forage production shows far greater variations in response to changes in annual precipitation than to different grazing intensities (Heitschmidt et al 2005). However, proper stocking rates and a planned grazing system are needed to ensure that the site remains in the Reference State #1. Without proper grazing management, the tall and mid grass community regresses to a blue grama, prairie junegrass, dense clubmoss community. In comparison to the high seral state, suggested stocking rates on sites in early seral states are about 75% lower. Experience indicates that planned grazing prevents further deterioration on sites in low seral states. Once the plant communities of the Reference State regress to early-successional communities, mechanical treatment may be necessary to induce and facilitate succession back across the threshold.

Poisonous plants are not normally a problem on this site. However, some of the milk vetches, death camas, larkspur, etc. may cause losses when forage demand by livestock exceeds forage supply. These conditions are most likely to occur during drought or by "turning-livestock-out" in early spring, before soil and vegetation conditions are ready for grazing.

Wildlife Interpretations

The Silty 10-14" p.z. ecological site that is in high seral or HCPC stages provides forage for mule deer and antelope during most of the year. However, the overall forage potential is limited by the relatively low production and diversity of forbs and shrubs. Low shrub cover also limits the potential of the site for thermal and escape cover. Most deer use occurs along the edges of the site where it borders woody draws, coulees, badland range sites, etc.

The species diversity and cover associated with either the high seral or HCPC states also provide habitat for sharp-tailed grouse and other upland birds. Much

of the use occurs along the transitions between the Silty 10-14" p.z. site and woodland draws. The relative absence of big sagebrush limits the potential of this site for sage grouse habitat. The few sage grouse that exist in the Glaciated Plains are associated with silver sagebrush.

Species diversity and litter also provide favorable habitats for deer mice, rabbits and other small mammals. Golden eagles, redtail and ferruginous hawks are often circling over the landscape searching for prey.

Sites that are in mid to low seral states are less suitable for big game, upland birds and small mammals. However, they are more suitable for prairie dogs. Prairie dog towns also have potential for use by burrowing owls, mountain plovers, and other wildlife species.

Plant Preferences by Animal Kind

Refer to NRCS Field Office Technical Guide, Section IIE, General Information, for tables displaying plant preferences by livestock and wildlife.

Hydrology Functions

Soils associated with this ecological site are in Hydrologic Soil Groups B and C. Infiltration rates are generally moderate. The runoff potential is also moderate, depending on slope and ground cover.

Good hydrologic conditions exist on this site when it is in either a high seral state or at HCPC. Canopy cover (grass, forbs and shrubs) is greater than 90% in these communities, which is conducive to high infiltration rates and minimal runoff and erosion.

Sites in early or low seral state are generally considered to be in poor hydrologic condition. Concerns are valid, not because of the amount of bare ground, but because the dense clubmoss and blue grama restrict the ability of the desirable tall and mid-grasses to utilize available moisture. Erosion is probably minor on most of these Silty 10-14" p.z. sites because soil is either protected by mid and tall, cool-season grasses, or by dense clubmoss and blue grama. Regardless of condition, bare ground is usually minimal.

Recreational Uses

Wood Products

This site has no significant value for wood products.

Other Products

This site is suitable for livestock grazing from May through October. Because grasses comprise about 80% of the production, the site is better-suited for cattle rather than sheep grazing.

Other Information

The Silty 10-14" p.z. ecological site in the northern Glaciated Plains is resistant to perturbations. However, the site loses its resiliency when the plant community regresses from a high to a mid seral state. As the site moves from HCPC to lower seral states, reproductive capability of desirable plants is restricted, annual production is less than 1/3 of its potential, litter is reduced, and the number of structural/functional groups are reduced.

Supporting Information

Associated Sites The following sites may be found in association with the Silty 10-14" p.z. ecological site. The Site ID indicates in which Rangeland Resource Units (RRU) these sites occur. For example, Site ID R052XN162MT occurs in RRU 52XN.

<u>Site Name</u>	<u>Site ID</u>	<u>Site Narrative</u>
Clayey 10-14" p.z.	R052XN162MT	Similar landscape position; different species composition and soil texture.
Sandy 10-14" p.z.	R053AE062MT	Similar landscape position; different species composition and soil texture.
Silty-Steep 10-14" p.z.	R052XN168MT	Slopes >15%; less forage production; different species composition.
Overflow 10-14" p.z.	R052XN166MT	Receives additional run-in moisture from Surrounding landscape; different species composition; higher productivity.
Shallow 10-14" p.z.	R052XN178MT	Soil depth less than or equal to 20 inches to a restrictive layer.

Similar Sites

<u>Site Name</u>	<u>Site ID</u>	<u>Site Narrative</u>
Silty 10-14" p.z.	R052XC217MT R053AE060MT	

State Correlation

This site has been correlated with the following states: Montana

Inventory Data References

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-Range-417 ECS-1 Modified Double Sampling	92	2001-2004	MT	Blaine, Roosevelt, Sheridan Valley, Daniels

Type Locality

State: MT

County:

Township:

Range:

Section:

UTM: Datum: NAD__ _____E ____N

General Description:

Sensitivity: Yes___ No___

Relationship to Other Classifications:

Other References

Briske, D. D., S. D. Fuhlendorf, and F. E. Smeins. 2005. State-and-transition models, thresholds, and rangeland health: a synthesis of ecological concepts and perspectives. *Rangeland Ecol. Manage.* 58: 1-10.

Frost, Cecil C. 1998. Presettlement fire frequency regimes of the United States: a first approximation. Pages 70-81 in Teresa L. Pruden and Leonard A. Brennan (eds.). *Fire in ecosystem management: shifting the paradigm from suppression to prescription.* Tall Timbers Fire Ecology Conference Proceedings, No. 20. Tall Timbers Research Station, Tallahassee, FL.

Heitschmidt, R. K., K. D. Klement, and M. R. Haferkamp. 2005. Interactive effects of drought and grazing on Northern Great Plains rangelands. *Rangelands Ecol. Manage.* 58: 11-19.

Romo, J. T., and Y. Bai. 2004. Seed bank and plant community composition, mixed prairie of Saskatchewan. *J. of Range Manage.* 57:300-304.

Site Description Revisions

The 2005 Silty 10-14" p.z. ecological site description replaces earlier dated versions of Silty 10-14" p.z. descriptions in Rangeland Resource Unit 52XN. This 2005 revision incorporates the State and Transition Model theory, additional data on site productivity, and an improved understanding of many rangeland health indicators.

Site Description Approval

This ecological site description is approved with the understanding that it is no more than another step in our continual effort to update the NRCS technical guide. In order to facilitate the process, NRCS field personnel are encouraged to forward existing information and/or new data that can be used to improve the utility of this site description. Please forward the information and data to the State Rangeland Management Specialist.

<u>Authors</u>	<u>Date</u>	<u>Approval</u>	<u>Date</u>
Dr. John Lacey	02/28/2005	Loretta J. Metz	03/19/2005
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