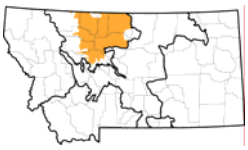
UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ECOLOGICAL SITE DESCRIPTION



ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site Name: Shallow 10-14 inch, p.z. (precipitation zone)

Site ID: R052XN178MT

Major Land Resource Area: 52XN --Glaciated Plains, Northern

Physiographic Features: This site occurs on undulating to rolling hills on the sedimentary and sandstone uplands with outcrops of shale, sandstone or rock. Slopes usually vary from 4 to 35 percent, but can be as steep as 65%. Elevations normally vary from 2,500 to 3,500 feet.

Land Form:
(1) hill
(2) ridge
(3) plain

	Minimum	Maximum
Elevation (feet):	1850	4500
Slope (percent):	1	65

Water Table Depth (inches):

Flooding:

Frequency: none
Duration: none

Ponding:

Depth (inches): none
Frequency: none
Duration: none

Runoff Class: high to very high

Aspect: occurs on all aspects (aspect, especially when combined with slope influences plant community)

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).

	Minimum	Maximum
Frost-free period (days):	74	113
>32F, 90% probability = Minimum 50% probability = Maximum		
Freeze-free period (days):	111	135
>28F, 90% probability = Minimum 50% probability = Maximum		
Mean annual precipitation (inches):	10	14

Climate Stations:
(1) #241722 - Chinook
(2) #241692 - Chester
(3) #243996 - Havre WSO AP
(4) #245340 - Malta 35S
(5) #247500 - Shelby
(6) #248939 - Whitewater

Influencing Water Features

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

Representative Soil Features

These soils are 10 to 20 inches deep. Sandstone bedrock or weakly consolidated sedimentary beds begin at 10-20 inches. Most herbaceous roots extend less than 20 inches below the soil surface. The Cabba, Cabbart, Ernem, Castner, Cheadde, and Rentsac soil components characterize this site. Loam and silt loam are the dominant textures. Soil ph varies from 7.4 – 9.0.

Predominant Parent Materials:
Kind: residuum
Origin: weathered from interbedded sedimentary rock

Surface Texture: (1) loam
(2) silt loam
(3) silty clay loam
Surface Texture Modifier: (1) none
Subsurface Texture Group: loamy
Surface Fragments < = 3" (% cover): 0 - 10
Surface Fragments >3" (% cover): 0 - 2
Subsurface Fragments < = 3" (% Volume): 13-16
Subsurface Fragments > 3" (% Volume): 0-4
Drainage Class: Well
Permeability Class: Moderately slow

	Minimum	Maximum
Depth (inches):	10	20
Electrical Conductivity (mmhos/cm):	0	4
Sodium Adsorption Ratio:	0	0
Calcium Carbonate Equivalent (percent):	--	--
Soil Reaction (1:1 Water):	7.4	9.0
Soil Reaction (0.1M CaC12):	---	---
Available Water Capacity (inches):	3	4

Plant Communities

Ecological Dynamics of the Site

This site developed through time under the influence of climate, geological materials, fire, plants and animals. Research consistently shows that precipitation is the principle 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 caries 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 10-12 years (Frost 1998). However, environmental characteristics of this site limit herbage production and subsequent fuel accumulation. Therefore, in comparison to other upland ecological sites, the role of fire is probably less significant in the development of this site.

The resultant historic climax plant community (HCPC) is the basis for plant community interpretations. The HCPC has been 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 and shrubs. About 70% of the annual production is from grasses and sedges, most of which is produced during the cool season. Forbs and shrubs contribute 10 and 20%, respectively, to total annual production. Total vegetative production averages 900 lbs/ac in normal years, 600 lbs/ac in "unfavorable" years, and 1100 lbs/ac in "favorable" years.

Departures from the HCPC generally result from management actions, drought, and/or a change in the natural fire regime. Because of shallow soils and steep slopes, plant communities are not highly resistant to disturbance. The site is considered fragile in the sense that vegetative vigor and composition will rapidly decline with continued adverse impacts. With favorable precipitation and/or prescribed grazing treatments the plant community can return to the HCPC. However, succession may be slow. Trends in plant community dynamics states,

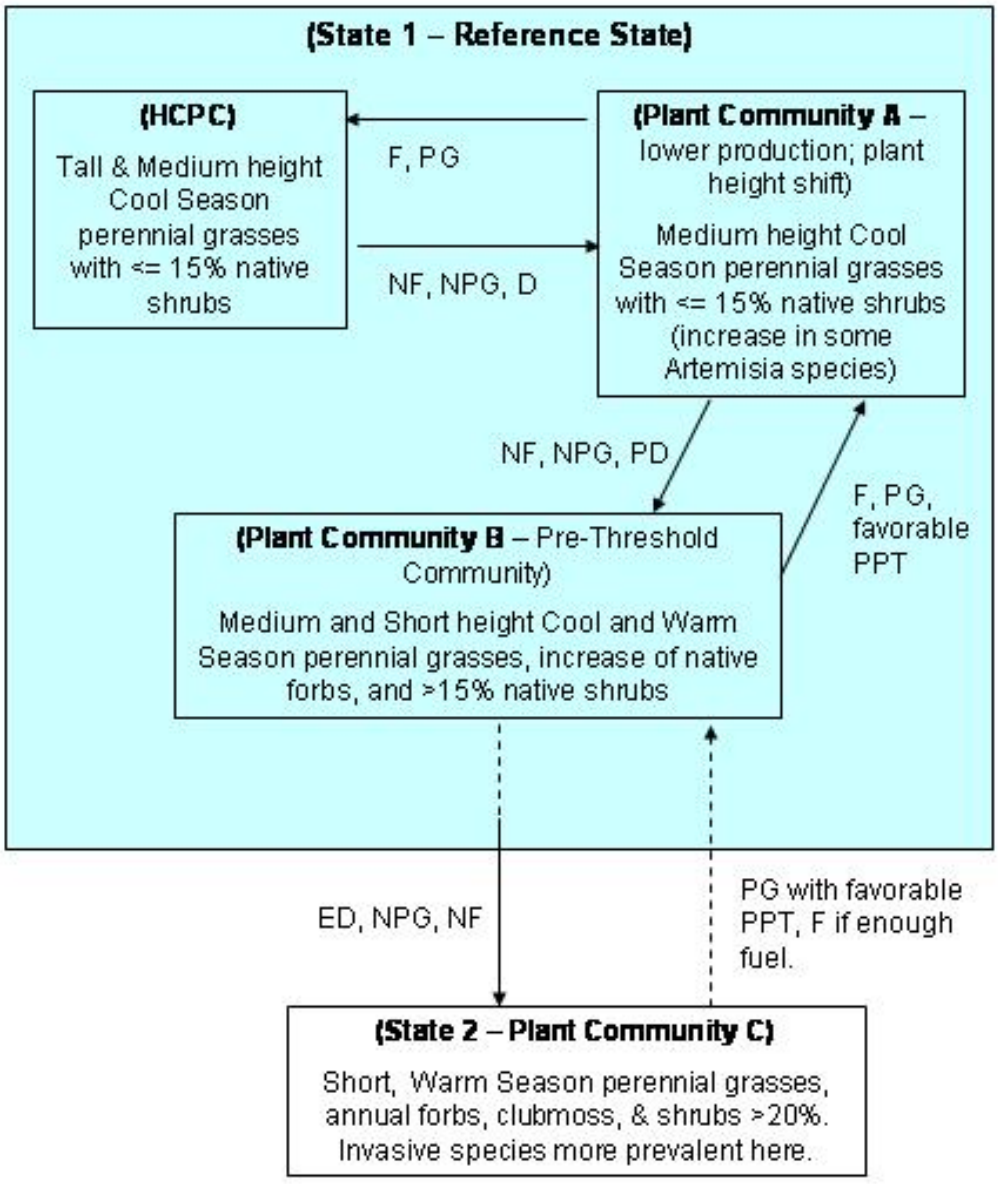
transitional pathways, and thresholds have been evaluated and determined through experience and research.

State and Transition Diagram

Successional pathways of the Shallow 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 in the mid-seral state. Succession back to the HCPC often does not occur within a reasonable length of time, without a large input of energy.

Three plant communities within the reference state (state #1) and the transition to a representative community of State #2 are depicted in the following state and transition model. Successional pathways between the communities within State #1 are also depicted. Ecological processes are discussed below in the plant community descriptions.

Shallow 10-14" p.z. RRUs 52XN, 52XC



Legend:

NF – No Fire
F – Fire (natural interval 10-12 yrs)
NPG – Non-prescribed grazing
PG – Prescribed grazing
PPT -- Precipitation
D – Drought (3-5 years)
PD – Prolonged drought (5-7 years)
ED – Extended drought (>7 years)

State #1: Historic Climax Plant Community (HCPC):

Bluebunch wheatrgrass, western/thickspike wheatgrass, green needlegrass, little bluestem, and needleandthread are the most common grasses in this community. Bluebunch wheatgrass is more prevalent in the western portion, rather than the eastern portion of the Glaciated Plains. These tall and mid, cool season grasses account for 60-70 percent of the total production.

Two warm season, short grasses (plains muhly and blue grama) and a mix of cool season short grasses (prairie junegrass, plains reedgrass, and sandberg bluegrass) commonly occur in the HCPC. Total production by short grasses usually represents less than 10% of the total production. Needleandthread, a mid-successional cool season bunchgrass, may produce from 10-20% of the total annual production.

American vetch (cool season) and purple and white prairie clover (warm season) are native, nitrogen-fixing legumes. They are valuable forage plants and are also an integral part of the HCPC. Milkvetch and prairie thermopsis are two additional legumes that fix nitrogen. However, they are generally rated as fair and poor forage for livestock, respectively. Bastard toadflax, aster, and hoods phlox should be no more than a minor component of the forb community.

Skunkbush sumac and winterfat, respectively, are important cool and warm season shrubs. They should be present in the HCPC. Shrubs such as creeping juniper, broom snakeweed, prickly pear cactus and fringed sagewort should be no more than a minor component of the community. Similarity indices >75% are associated with this community.

Tall and mid cool season grasses generally dominate the HCPC. However, the Shallow 10-14" p.z. ecological site is not characterized by a precise assemblage of species that remains constant from place to place or from year to year. Variability is apparent in productivity and occurrence of individual species. For example, little bluestem and sideoats grama production is favored on north and east aspects, while bluebunch wheatgrass and needleandthread growth is favored on south and west aspects. Little bluestem and needleandthread also prefer coarse textured soils, rather than fine textured soils.

The HCPC often regresses to lower seral stages. Regression may result from grazing management strategies that do not allow adequate recovery periods between grazing events, drought, and/or the disruption of the normal fire sequence. The above disturbances favor the replacement of little bluestem, bluebunch wheatgrass, western/thickspike wheatgrasses, and other deep-rooted, perennial grasses by blue grama, sandberg bluegrass, prairie junegrass, hairy goldenaster, hoods phlox and clubmoss. Winterfat, skunkbush sumac, and other desirable shrubs may also be replaced by broom snakeweed, fringed sagewort, etc. Cheatgrass and Japanese brome may colonize the site. As the result of

these vegetative changes, there is less litter to protect the soil and less infiltration. Hydrologic cycles are impaired as plant communities are unable to effectively use precipitation.

Plant cover (litter, and canopy of grasses, forbs and shrubs) is greater than 70% Therefore, plant cover and litter are adequate to optimize infiltration, minimize runoff and erosion, and provide good hydrologic conditions. Research and experience have not shown that excess litter adversely impacts ecological processes on the shallow 10-14" ecological site. The diverse mix of species found at HCPC help warm and cool season grasses, forbs, and shrubs ensures that the soil profile contains an adequate mix of deep and shallow roots to maintain or increase infiltration rates and reduce runoff. Runoff and soil erosion normally increase as the HCPC regresses to earlier seral states. However, the ecological role of fire on Shallow sites is not fully understood. Fires would presence of clubmoss cover may reduce runoff and soil erosion on some soils. Clubmoss is also very competitive. Once it forms a mat, observations and experience along Montana's Highline indicate that plant succession and site resiliency are adversely impacted. Most ecologists recognize that significant managerial changes are needed before a clubmoss community can return to HCPC.

The HCPC is believed to have evolved with periodic fires occurring at intervals of 10-12 years. Fires temporarily reduce litter and favor, thus allowing more runoff. However, fire favors the succession of grasses and forbs at the expense of half-shrubs and shrubs. It is believed that frequent fires would have reduced clubmoss. As fire frequency decreased with the establishment of ranches and farms, clubmoss and the woody component of some communities may have increased. Where fuel loads increased above historic levels, today's fires may burn hotter and increase the potential for accelerated wind and water erosion.

Historic Climax Plant Community Plant Species Composition:

GRASSES /GRASSLIKES					Annual Production in
70% of Community, 675 lbs/ac			Group Allowable		Pounds Per Acre
Common Name*	Scientific Name*	Group	Pounds Per Acre		Low	High
			Low	High		
Bluebunch wheatgrass	*Pseudoroegneria spicata*				0	270
Western wheatgrass	*Pascopyrum smithii*	1	90	225	45	115
Thickspike wheatgrass	*Elymus macrourus*	1			45	110
Plains muhly	*Muhlenbergia cuspida*				45	90
Little bluestem	*Schizachyrium scoparium*				45	90
Prairie sandreed	*Calamovilfa longifolia*				90	180
Needle and thread	*Hesperostipa comata*		*90 lbs/ac is max		90	180
Blue grama*	*Bouteloua gracilis**		allowed for all		0	90
Threadleaf sedge*	*Carex filifolia**		species in this group;		0	90
Sandberg bluegrass*	*Poa secunda**		no more than 30 lbs		0	90
Praire junegrass*	*Koeleria macrantha**		for any one species.		0	90
Plains reedgrass*	*Calamagrostis montanensis**				0	90
Other native grasses*					0	90

FORBS					Annual Production in	
10% of Community, 90 lbs/ac			Group Allowable		Pounds Per Acre	
Common Name	Scientific Name	Group	Pounds Per Acre		Low	High
			Low	High		
American vetch	*Vicia americana*				9	45
Purple prairie clover	*Dalea purpurea*	3	18	90	9	45
White prairie clover	*Dalea candida*	3			9	45
Scarlet globemallow*	*Sphaeralcea coccinea**				0	45
Prairie thermopsis*	*Thermopsis rhombifolia**				0	45
Pussytoes*	*Antennaria spp.**				0	45
Bastard toadflax*	*Comandra umbellata**		90 lbs/ac is		0	45
Milkvetch*	*Astragalus spp.**		maximum allowed		0	45
Penstemon*	*Penstemmon spp.**		for all forbs		0	45
Hoods phlox*	*Phlox hoodii**		*50 lbs/ac is max for		0	45
Eriogonum*	*Eriogonum spp.**		all species in group;		0	45
Dense clummoss*	*Selaginella densa**		no more than 20		0	T
Other native forbs*			lbs/ac for any one		0	45
			species.			

SHRUBS AND HALF-SHRUBS					Annual Production	
20% of Community, 135 lbs/ac			Group Allowable		in Pounds Per Acre	
Common Name	Scientific Name	Group	Pounds Per Acre		Low	High
			Low	High		
Skunkbush sumac	*Rhus trilobata*				10	45
Winterfat	*Krascheninnikovia lanata*				10	45
Rubber rabbitbrush	*Ericameria nauseosa*		180 lbs/ac is the max		0	45
Silver sagebrush	*Artemisia cana*		allowed for all shrubs;		0	45
Snowberry	*Symphoricarpos spp.*		no more than 40 lbs/ac		0	45
Rocky Mountain juniper	*Juniperus scopulorum*		for any one species.		0	45
Fringed sagewort	*Artemisia frigida*				0	45
Rose	*Rosa spp.*				0	45
Creeping juniper	*Juniperus horizontalis*				0	45
Broom snakeweed	*Gutierrezia sarothrae*				0	45
Plains pricklypear	*Opuntia polyacantha*				0	45
Other native shrubs					0	45

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								
15	1-4	5-10	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
				0-1	0-1	50	0-5	0-5	T	0	10-20

Structure of Canopy Cover (%)

	Grass/Grasslike	Forb	Shrub/Vine	Tree
<= 0.5 feet	T	T	T	0
>0.5 - <=1 feet	25	45	25	0
>1 - <=2 feet	50	45	50	0
>2 - <=4.5 feet	25	10	25	0
>4.5 - <=13 feet				T
>13 - <= 40 feet				T

Annual Production by Plant Type:

Plant Type	Annual Production (lbs/AC) Low	RV*	High
Grasses /Grasslike	420	630	770
Forb	60	90	110
Shrub/Vine	120	180	220
Tree	T	T	T
Total	600	900	1100

*RV means "representative value".

***Successional Pathway from HCPC to Plant Community A:**
Non-prescribed grazing, drought and/or a cessation of fire will cause regression from HCPC to Community A.

Plant Community A (State #1):

Plant Community A is characterized by a mix of tall, mid and short grasses and sedges. Range inventories conducted by NRCS on the Fort Peck and Belknap Reservations indicate similarity indices of 55-75 are indicative of this community. The lower-stature plants tend to produce less forage than the mid grasses that they replaced. In contrast to the HCPC, total vegetation production may be 10-20% lower in Community A

In comparison to the HCPC, the amount of needleandthread grass has increased, while western/thickspike wheatgrasses decreased. Blue grama and threadleaf sedge increased and are more common in the community. The total percentage of warm season, lower successional species (hariy goldenaster, scurfpeas, hoods phlox, and aster) has increased. Although some of the native shrubs decline in vigor and abundance, fringed sagewort and silver sagebrush often increase. Thus the total shrub component may be greater than 15%.

Effects of grazing management and/or climatic conditions are visible. Preferred forage species are grazed and/or stunted, canopy cover is reduced, litter is reduced, and bare ground is increased. In comparison to the HCPC, this community is slightly drier. Thus, species such as blue grama, prairie junegrass and some increaser forbs have gained a competitive advantage over the tall, cool

season, deep-rooted perennial grasses. The short grasses are able to compete more successfully with the tall grasses because of the ability of relatively shallow root systems to utilize shallowly penetrating moisture, characteristic of drier habitats (Coupland, 1961).

(Insert Plant Community A photo)

***Successional Pathway from Community A to HCPC:**
Succession from Plant Community A to HCPC occur fairly readily, and usually result from either planned grazing management, reintroduction of the natural fire regime, and/or periods of favorable precipitation. This succession can occur within a few years.

***Successional Pathway from Community A to Plant Community B:**
Community A will regress to Community B under non-prescribed grazing, prolonged drought, of an extended period of no fire. The rate of regression varies with the intensity of the disturbances. Severe drought may cause retrogression within a couple years.

Plant Community B (State #1):

Plant Community B is dominated by a mix of medium and short grasses. In comparison to Community A, the short grasses contain more blue grama, a warm season species. The number of warm season forbs, such as hairy goldenaster, aster, and western yarrow increase and replace the prairie clovers, American vetch, and black Sampson. The warm season half-shrub, fringed sagewort, also increases. Thus, this community is characterized by a functional shift from a cool season dominant to more warm season species. Litter varies from 10-15%. In contrast to the HCPC, there is about1/3 more bare ground. Rills, flow patterns and litter deposits are visible.

Similarity indices of 45-55 characterize this plant community. Blue grama, threadleaf sedge, needleandthread and clubmoss have increased in the community by replacing some of the mid grasses. Total annual production normally varies from 500-600 lbs/ac.

Plant community B is called the "pre-threshold community". It is a critical that this community be recognized and strategies implemented to prevent further regression. Although this community can improve to either Community A or HCPC through successional processes, further disturbance will result in regression to a lower state. Once Community B regresses to a lower state, normal successional processes are usually restricted.

(Insert Plant Community B photo)

***Successional Pathways from Plant Community B to Plant Commmunity A:**
This varies with environmental conditions. Generally, as the percentage of warm season short grasses and warm season forbs increase above 35%, succession to Plant Community A and eventually HCPC become slower and are less likely to occur. Succession is more likely to occur with prolonged periods of favorable rainfall combined with prescribed grazing. A reintroduction of the natural fire regime may also aid in shifting Plant Community B back to Plant Community A or the HCPC.

***Transition from Plant Community B to State #2:**
Transitions from State #1 (Plant Community B) to State #2 occur under prolonged, heavy continuous grazing. Prolonged drought exacerbates the retrogression, and lack of the natural fire regime also facilitates the transition.

State #2: Plant Community C:

Blue grama, threadleaf sedge and clubmoss dominate the community. The group of short, warm season grasses and sedges produce nearly ½ of the vegetation. Prickly pear cactus and annual grasses have also increased. Western/thickspike wheatgrasses and bluebunch wheatgrass occur as scattered plants or remnants. Needleandthread declined in vigor and it has been supplanted by lower-successional grasses and forbs. Similarity indices vary from 0-35. Total annual vegetation production averages about 300 lbs. Litter cover declines to 15-20%. However, the decline in litter is partially off-set by an increase in clubmoss cover (often exceeding 20%). Initial runoff rates from clubmoss-covered soils are reduced compared to bare ground, but may increase as the clubmoss becomes saturated. Because of the steep slopes and shallow soils, soil erosion is a major resource concern.

(Insert Plant Community C photo)

***Transition from State #2 to State #1:**
This plant community (State #2) is resistant to change. Blue grama and clubmoss form a thick sod which provides a competitive advantage for limited precipitation. Although the sod appears to prevent seedling establishment of high-successional species, recent research indicates the absence of seedlings within a mat of clubmoss is due to an inadequate seed bank in the soil (Romo and Bai 2004). When clubmoss cover is more than 20-25%, succession is not expected to occur within a reasonable length of time. However, significant succession may occur if the top soil is intact and if clubmoss is no more than a minor component of the plant community. Succession would be favored by prescribed grazing, an extended period of favorable precipitation and the re-implementation of the natural fire regime. The potential for succession is depicted by the dashed line in the diagram.

Significant economic inputs and time are required to move this plant community toward a higher successional state (those communities found in State #1) when the plant community is dominated by clubmoss, or if the soil surface has been lost to erosion. Production on a Shallow 10-14" p.z. ecological site is 40-50% less than it is on ecological sites with soils > 20 inches deep (eg, Silty 10-14" p.z., Clayey 10-14" p.z., and Sandy 10-14" p.z.). The lower response potential from mechanical treatment has a proportionate effect on the potential economic benefits. Therefore, mechanical treatments and range seeding are not normally recommended on shallow sites. In comparison to "normal" sites, environmental risks (such as erosion) are greater while economic benefits are less.

Ecological Site Interpretations

Animal Community

Livestock Management

The Shallow 10-14" p.z. ecological site is suited for livestock grazing. However, prescribed grazing management is needed. Forage production is limited by shallow soils and occasional steep slopes, which adversely affect grazing distribution and utilization. Species composition is susceptible to heavy stocking and season long grazing. Non-prescribed grazing on steep slopes and shallow soils results in soil compaction, a decrease in vegetative cover and litter, and a subsequent increase in bare ground. Surface runoff, soil erosion and site deterioration are the end result.

Coupland (1992) reviewed research on the mixed grass prairie and concluded that, "for various reasons, grazed habitats tend to be drier than ungrazed grassland." This is also true on the Shallow 10-14" p.z. ecological site. Grazing reduces plant density, plant height, and litter. There is less vegetative cover to protect the soil from the sun and wind. The amount of litter declines because there is a lower supply of dead leaves, and some dead materials are trampled into the soil surface.

The Shallow 10-14" p.z. ecological site, as do most other sites in the northern mixed prairie, has a component of warm season, short grass species. The short grasses usually increase with grazing and decrease with prescribed grazing. However, succession is not guaranteed in the northern mixed prairie. Sampling four-year old ungrazed exclosures and grazed areas with 35% utilization, Vogel and Van Dyne (1966) found essentially the same basal cover of grasses, sedges, forbs, litter and bare soil on protected and grazed sites. They concluded that four years was too short of a time for plant cover to change significantly. Hofmann and Ries (1989) observed similar results following a four-year study in North Dakota. Even after 41 years of exclosure (non-use by livestock), changes in species composition can be relatively small when the site is in the dry, low production portion of northern mixed prairie (Brand and Goetz, 1986). Although they concluded that site characteristics limited the development of potential vegetation with the exclusion of grazing, the authors did not discuss the potential impacts of prescribed grazing on succession. The Shallow 10-14" p.z. ecological site is not as productive as the sites evaluated in the above research. Therefore, range managers should recognize the environmental limitations of this site. Prescribed grazing management is always a good recommendation.

Seeding and/or mechanical treatment are usually not recommended on the Shallow 10-14" p.z. ecological site. However, range management goals may include treating a large area of deeper soils, in which the shallow site is a minor component of a larger mapping unit. In this situation it is often impractical to avoid the shallow component, thus treating the smaller area is incidental to treating the larger area of deeper soils.

Wildlife Interpretations

The HCPC associated with the Shallow 10-14" p.z. ecological site provides diverse and valuable wildlife habitat. This ecological site often occurs as a mosaic with other ecological sites, thus creating more "ecotones". This results in an increase in "edge effects" which potentially benefit most species of wildlife. The landscape provides thermal and escape cover. Mule deer and antelope utilize the abundance and diversity of forbs and shrubs. The mix of cool and

warm season forage species (grasses, forbs and shrubs) ensures the availability of forage for wildlife from early spring through the fall seasons.

Shallow 10-14" p.z. ecological sites become less valuable for deer and antelope when plant diversity is low. For example, the disappearance of either the tall warm season grass or cool season grasses would shorten the length of the "green forage" season. The increase of blue grama, clubmoss, hoods phlox etc. is also associated with the loss of higher successional forbs. These changes tend to adversely impact foraging opportunities for deer, antelope, upland birds, etc. Densities of a specific species of mouse, rat or other small mammal vary with habitat conditions characterizing the respective Communities and States.

Hydrology Functions

Water is the main factor limiting vegetative production on this site. Soil components in this ecological site are normally classed into Hydrologic Group C. These soils have a medium to very high runoff potential, with hydrologic curves of 74 to 86. Field investigations are needed to adjust the curves when plant communities deteriorate from the HCPC. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff.

Recreational Uses

This site provides hunting opportunities for upland game species. Photographers also appreciate the Shallow 10-14" p.z. ecological site for its diverse mix of plants, beauty and solitude.

Wood Products

This site has no significant value for wood products.

Other Products

Other Information

The Shallow 10-14" p.z. ecological site is not highly resistant to disturbances. Species diversity is adversely affected by season long continuous grazing and by heavy stocking. Mid and tall grasses are replaced by short grasses. The number of structural/functional groups is reduced with retrogression, which adversely affects the amount of solar energy that is captured and converted to carbohydrates. A reduction in total vegetative growth results in less potential vegetation that can be transformed into litter. Litter reductions result in less infiltration, and more runoff and soil erosion. Rills and gullies are not evident in the HCPC.

Supporting Information

Associated Sites The following sites may be found in association with the Shallow 10-14" p.z. ecological site. The Site ID indicates in which Rangeland

Resource Unit (RRU) these sites occur. For example, Site ID R052XN161MT occurs in RRU 52XN.

Site Name	Site ID	Site Narrative
Silty 10-14" p.z.	R052XN161MT	soils >20 inches in depth, and slopes < 15%.
Silty-Steep 10-14" p.z.	R052XN168MT	soils >20 inches deep and occurs on slopes greater than 15%.
Very Shallow 10-14" p.z.	R052XN085MT	<10 inches deep, with a water holding capacity of 2 inches or less.
Shallow Clay 10-14" p.z.	R052XN179MT	soils are clayey over clayey shale.

Similar Sites

Site Name	Site ID	Site Narrative
Shallow 10-14" p.z.	R052XC214MT	

State Correlation
This site has been correlated with the following states: Montana

Inventory Data References

Data Source	Number of Records	Sample Period	State	County
SCS-Range-417				
ECS-1				
Modified Double Sampling	13	2004	MT	Blaine, Phillips, Daniels Valley, Roosevelt

USDA-SCS-MT 1981 Technical Range Site Description

Type Locality
State: MT
County:
Township:
Range:
Section:
UTM: Datum: NAD__ _____E ____N
General Description:
Sensitivity: Yes___ No___

Relationship to Other Classifications:

Other References

Brand, M.D. and H. Goetz. 1986. Vegetation of exclosures in Southwestern North Dakota. J. Range Manage. 39:434-437.

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Site Description Revisions

The 2005 Shallow 10-14" p.z. ecological site description replaces earlier dated versions of the Shallow 10-14" p.z. description 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.

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