USDA Natural Resources Conservation Service

Ecological site R055BY070ND
Shallow Marsh

Accessed: 05/10/2025

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

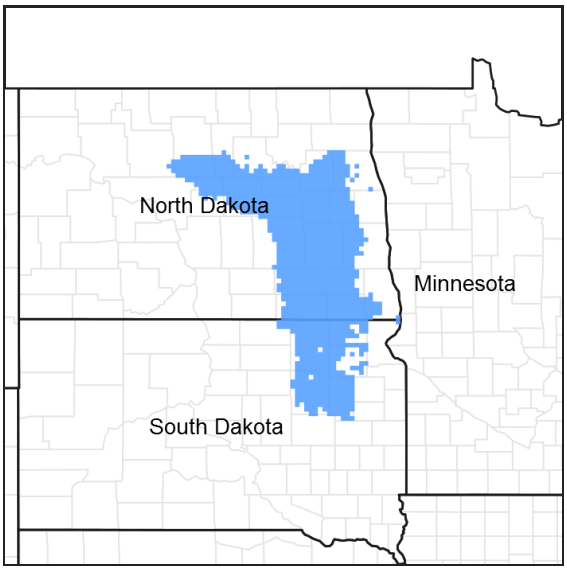


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Classification relationships

Level IV Ecoregions of the Conterminous United States: 42a – Missouri Coteau; 42b – Collapsed Glacial Outwash; 42c – Missouri Coteau Slope; 42d – Northern Missouri Coteau; 42f – Southern Missouri Coteau Slope; 42g – Ponca Plains; and 42h – Southern River Breaks.

Associated sites

R055BY065ND	**Subirrigated**
R055BY071ND	**Wet Meadow**

Similar sites

R055BY071ND	**Wet Meadow** (R055BY071ND) – Wet Meadow [woolly sedge dominant, more reedgrasses and prairie cordgrass, lower production.]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified

Herbaceous	(1) *Carex atherodes* (2) *Glyceria grandis var. grandis*

Physiographic features

This site occurs on concave to level depressional areas.

Table 2. Representative physiographic features

Landforms	(1) Pothole (2) Depression
Flooding frequency	None
Ponding duration	Long (7 to 30 days) to very brief (4 to 48 hours)
Ponding frequency	Occasional to frequent
Elevation	1,000–2,100 ft
Slope	0–1%
Ponding depth	0–12 in
Water table depth	0–18 in
Aspect	Aspect is not a significant factor

Climatic features

MLRA 55B is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature are characteristic. 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. The air masses move unobstructed across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 16 to 21 inches per year. The normal average annual temperature is about 41.5° F. January is the coldest month with average temperatures ranging from about 2° F (Maddock, ND) to about 11° F (Mellette, SD). July is the warmest month with temperatures averaging from about 67° F (Maddock, ND) to about 73° F (Redfield 2 NE, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 64° F. This large annual range attests to the continental nature of this MLRA's climate. Winds average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of native cool-season plants begins in late March and continues to early to mid July. Native warm-season plants begin growth in mid May and continue to the end of August. Green up of cool-season plants can occur in September and October when adequate soil moisture is present.

Table 3. Representative climatic features

Frost-free period (average)	140 days
Freeze-free period (average)	161 days
Precipitation total (average)	21 in

Influencing water features

Soil features

These are very deep, very poorly drained, medium- to fine-textured soils. Salinity and sodicity are none to slight. Water tables on this site range from 1.5 feet above to 6 inches below the surface during most of the growing season. This site is in deep depressions on lake plains, till plains, and moraines. Slope ranges from 0 to less than 3

percent. The surface soil texture is typically silt loam to silty clay loam, and ranges from 10 to 16 inches in depth. This site should show no evidence of rills, wind scoured areas or pedestalled plants. The soil surface is stable and intact.

Sub-surface soil layers are non-restrictive to water movement and root penetration. These soils are not susceptible to water erosion. Ponded water conditions and slow permeability strongly influences the soil-water-plant relationship. Access Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/) for specific local soils information.

Table 4. Representative soil features

Surface texture	(1) Silty clay loam (2) Silt loam (3) Loam
Family particle size	(1) Clayey
Drainage class	Poorly drained
Permeability class	Moderately rapid to very slow
Soil depth	80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Calcium carbonate equivalent (0-40in)	0–20%
Electrical conductivity (0-40in)	0–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0–1
Soil reaction (1:1 water) (0-40in)	6.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–2%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

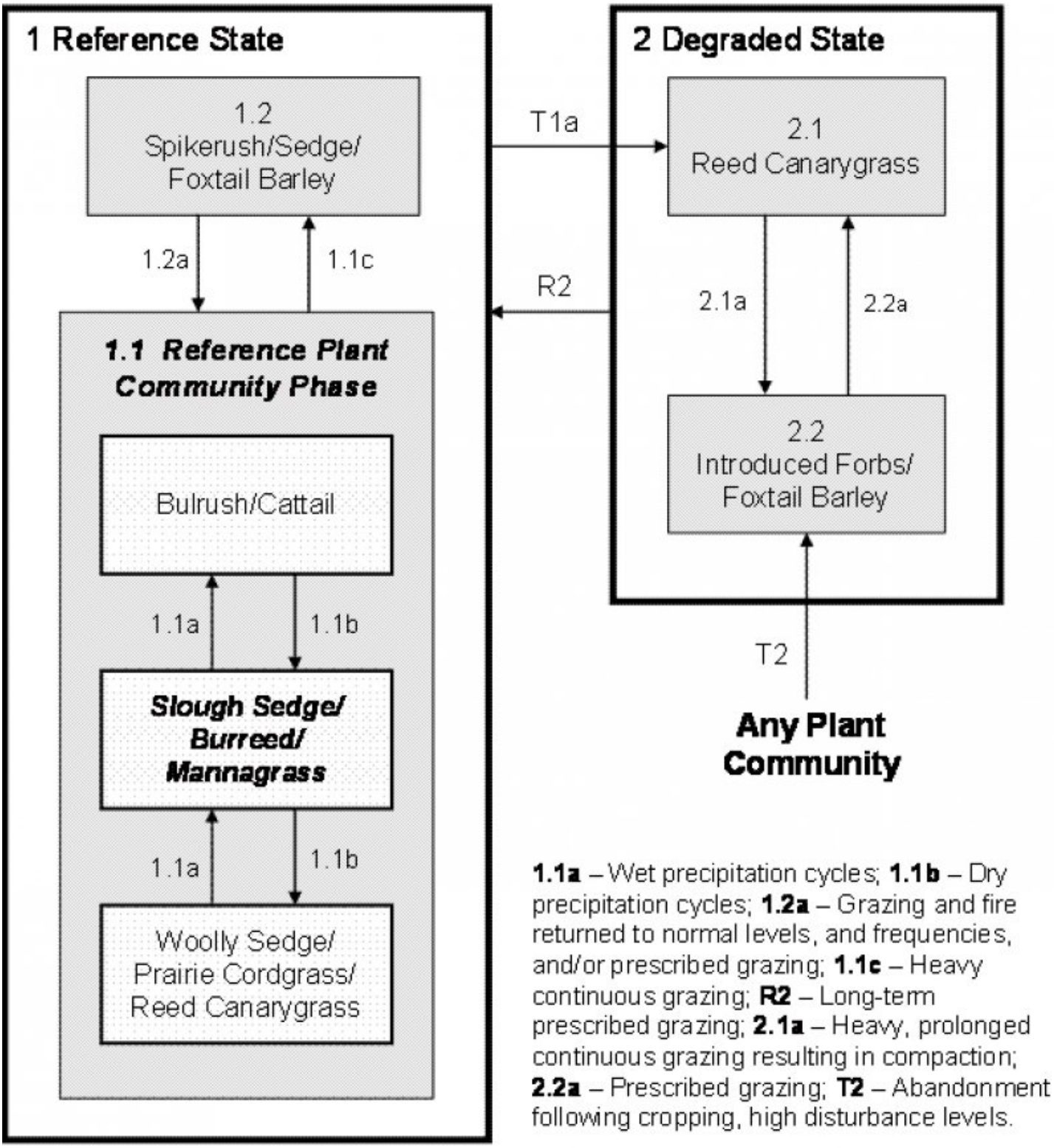
The site developed under Northern Great Plains climatic conditions, and included natural influence of large herding herbivores and occasional fire. Changes will occur in the plant communities due to weather fluctuations and/or management actions. Under adverse impacts, a relatively rapid decline in vegetative vigor and composition can occur. Under favorable conditions the site has the potential to resemble the Reference State. Interpretations for this site are based primarily on the Slough Sedge/Burreed/Mannagrass Plant Community Phase (1.1). This community phase and the Reference State has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been considered. Community phases, community pathways, states, transitions, thresholds and restoration pathways have been determined through similar studies and experience.

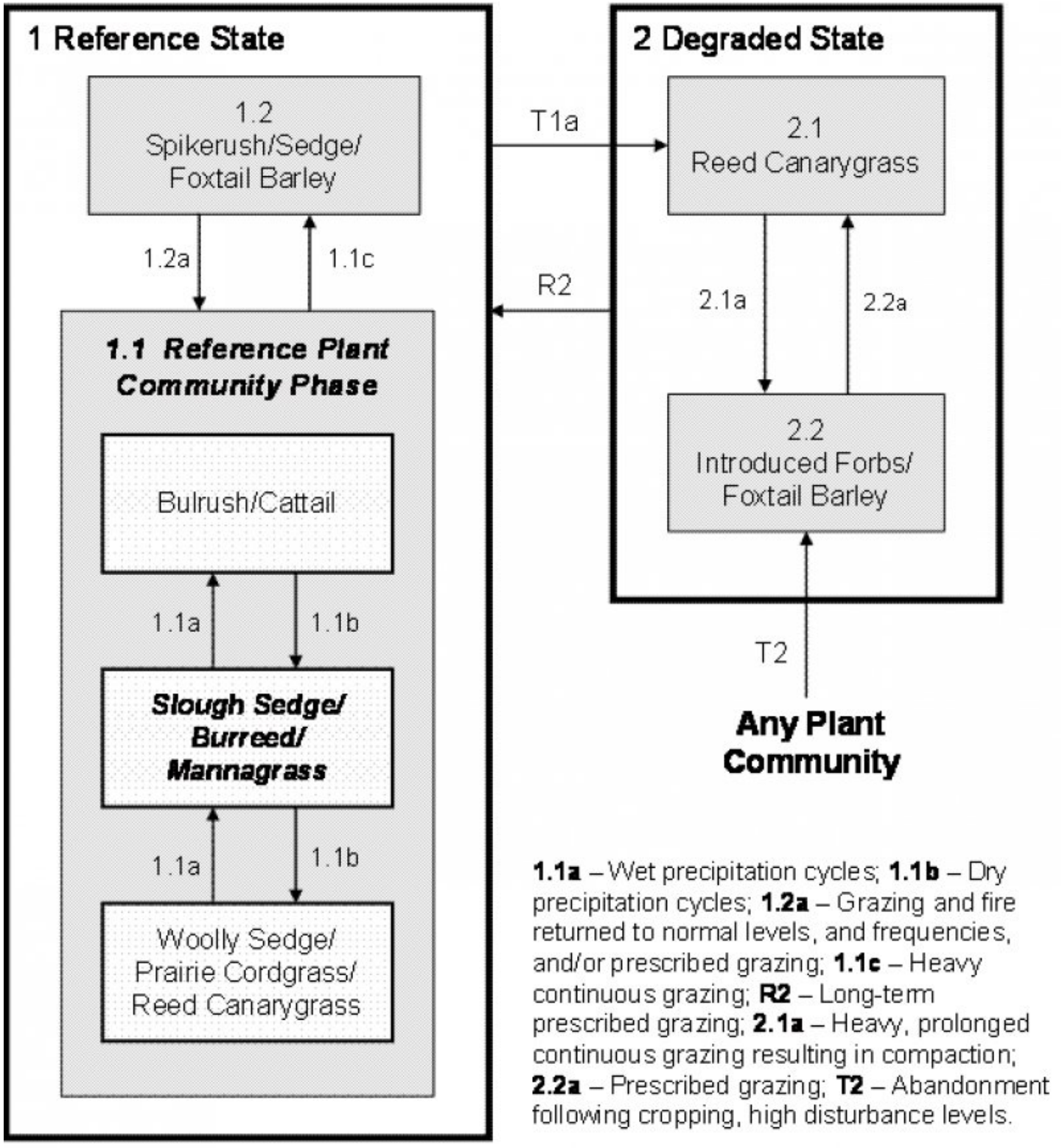
This ecological site has been grazed by domestic livestock since introduced into the area. The introduction of domestic livestock and the use of fencing and reliable water sources have changed the disturbance regime of this site. Heavy continuous grazing without adequate recovery periods following each grazing occurrence causes this site to depart from the Reference State. Species such as fowl bluegrass, spikerush, and Baltic rush will initially increase. Whitetop and slough sedge will decrease in frequency and production. Continued heavy grazing eventually causes a dominance by spikerush, rushes and unpalatable forbs such as curly dock.

Following the state and transition diagram are narratives for each of the described states and community phases. These may not represent every possibility, but they are the most prevalent and repeatable states/community

phases. The plant composition tables shown below have been developed from the best available knowledge at the time of this revision. As more data are collected, some of these community phases and/or states may be revised or removed, and new ones may be added. The main purpose for including the descriptions here is to capture the current knowledge and experience at the time of this revision.

State and transition model





State 1
Reference

This state represents the natural range of variability that dominates the dynamics of this ecological site. This state is typically dominated by cool-season grass and grass-like species. Before European settlement, the primary disturbance mechanisms for this site in the reference condition included periodic fire, grazing by large herding ungulates, and fluctuations in the water table and ponding frequency and duration. Timing of fires and grazing coupled with weather events dictated the dynamics that occurred within the natural range of variability. Today the primary disturbance is from a lack of fire, concentrated livestock grazing, and weather fluctuations. Species that are desirable for livestock and wildlife can decline and a corresponding increase in less desirable species will occur.

Community 1.1

Reference Plant Community Phase

Interpretations are based primarily on the Slough Sedge/Burreed/Mannagrass plant community within the Reference Plant Community Phase. This plant community evolved with grazing by large herbivores and occasional fire, as well as periodic inundation and drying, and can be maintained with prescribed grazing, prescribed burning, or areas receiving occasional short periods of rest or deferment. This plant community phase has three sub-phases, just referred to as plant communities here. These sub-phases are mainly driven by precipitation and ponding/drying sequences. In all of these sub-phases, the soil is covered by vegetation and little bare ground is present. Runoff is minimal, and erosion is typically not a concern. Litter falls in place, and there are typically no water flow patterns, pedastalling, or terracettes. Slough Sedge/Burreed/Mannagrass Plant Community: This community sub-phase was the most dominant both temporally and spatially. The prevailing climate and weather patterns favored the development of this community dominated by cool-season grass-likes and tall and mid cool-season grasses. The dominant species include slough sedge, broadfruit burreed, fowl and/or American mannagrass, spikerush, American sloughgrass, and whitetop. Other grass and grass-like species include woolly sedge, bottlebrush sedge, softstem bulrush, hardstem bulrush, and prairie cordgrass. Significant forbs include common waterparsnip, hedgenettle, northern water plantain, Pennsylvania smartweed, swamp smartweed, and curlytop knotweed. This was the reference plant community phase and is described in the “Plant Community Composition and Group Annual Production” portion of this ecological site description. Bulrush/Cattail Plant Community: This community sub-phase occurs during prolonged wet precipitation cycles which lead to increased ponding duration and often depth. Softstem bulrush, hardstem bulrush, and American bulrush initially increase, soon followed by cattail species. Spikerush and rush also increase, and though diminished, slough sedge remains as the most prevalent sedge species. With a return to more normal precipitation and runoff from adjacent uplands, the plant community will readily return to the Slough Sedge/Burreed/Mannagrass plant community sub-phase. Woolly Sedge/Prairie Cordgrass/Reed Canarygrass Plant Community: This community sub-phase occurs during prolonged dry precipitation cycles which lead to decreased ponding duration and depth. Woolly sedge, prairie cordgrass, reed canarygrass, and other sedges from the adjacent, drier sites will increase. Though diminished, slough sedge, burreed, and mannagrass will remain prevalent in the community. With a return to more normal precipitation and runoff from adjacent uplands, the plant community will readily return to the Slough Sedge/Burreed/Mannagrass plant community sub-phase.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	4400	4875	5550
Forb	1100	1625	1950
Total	**5500**	**6500**	**7500**

Figure 5. Plant community growth curve (percent production by month). ND5506, Central Black Glaciated Plains, lowland cool-season dominant.. Cool-season dominant, lowland..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	10	37	35	5	2	8	0	0	0

Community 1.2
Spikerush/Sedge/Foxtail Barley

This plant community will slowly develop from the adverse effects of continuous grazing, without adequate recovery periods between each grazing event during the growing season. When compared to the 1.1 Slough Sedge/Burreed/Mannagrass Plant Community Phase, whitetop, slough sedge, burreed, and American mannagrass have decreased. The grass-like species, such as spikerush, rush, and the less palatable sedges increase and tend to dominate this plant community. The plant community is stable and protected from excessive erosion. The biotic integrity of this plant community is usually intact. The watershed is functioning. If grazing pressure continues, compaction can begin to occur, and the site can begin to effectively become drier over time. This shift can allow for the introduction of non-native forb and grass species, and cause this plant community to cross a threshold leading to the Degraded State (State 2). Community Pathway 1.2a – This community pathway occurs with a return to more normal disturbance levels and frequencies, or can be initiated by implementation of prescribed grazing

management which includes adequate recovery periods following each grazing event, and stocking levels which match the available resources. If properly implemented, this will shift the competitive advantage from the less palatable, shorter-rooted grass-like species such as spikerush to the mixture of sedges and mid and tall cool-season grasses. This pathway will lead the community back to the Reference Plant Community Phase (1.1).

Figure 6. Plant community growth curve (percent production by month). ND5506, Central Black Glaciated Plains, lowland cool-season dominant.. Cool-season dominant, lowland..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	10	37	35	5	2	8	0	0	0

Pathway 1.1a
Community 1.1 to 1.2

This community pathway is typically triggered by heavy continuous grazing or continuous season-long grazing without adequate recovery periods. This may also occur with grazing pressure combined with prolonged below average precipitation events. This pathway results in the Spikerush/Sedge/Foxtail Barley Plant Community Phase (1.2). Spikerush and the less palatable sedges will increase. With a loss of production and plant cover, the site will tend to dry slightly, allowing the foxtail barley to become established from adjacent sites. The change in plant functional and structural groups and the composition and distribution of the vegetation causes a decrease in production and a corresponding decrease in infiltration. Nutrient cycling is restricted as the rooting depth of the vegetation decreases with the change in functional and structural groups. Plant community diversity is reduced with a loss of native forb diversity and minor grass components.

Pathway 1.2a
Community 1.2 to 1.1

This community pathway occurs with a return to more normal disturbance levels and frequencies, or can be initiated by implementation of prescribed grazing management which includes adequate recovery periods following each grazing event, and stocking levels which match the available resources. If properly implemented, this will shift the competitive advantage from the less palatable, shorter-rooted grass-like species such as spikerush to the mixture of sedges and mid and tall cool-season grasses. This pathway will lead the community back to the Reference Plant Community Phase (1.1).

State 2
Degraded

This state is characterized by an effective drying of the site due to the presence of reed canarygrass, or due to an increase in bare ground due to trampling caused by excessive use (which leads to increased evapotranspiration). It is also characterized by the dominance of highly competitive species. The variety of reed canarygrass that is present in phase 2.1 is considered non-native. Often the species that dominate the site in phase 2.2 are also non-native invasive species. In either case, the biotic integrity of the site is greatly diminished, and typically diversity is much lower.

Community 2.1
Reed Canarygrass

This plant community phase is a result of a lack of disturbance and results in an increase in reed canarygrass which often leads to a plant community completely dominated by this grass. Reed canarygrass is very inefficient in its water use, and will tend to dry out the site. While the site still provides some benefit to large ungulates, there is little other resource value associated with this phase. If this phase continues undisturbed, the litter will continue to build up, and even the reed canarygrass will become somewhat decadent over time. Nutrient cycling will be severely impaired, as is the biotic integrity. Community Pathway 2.1a – This community pathway is triggered by a change in the natural disturbance regime, most often caused by continuous grazing without adequate recovery periods. Chronic heavy grazing for extended periods during the growing season will also favor this shift. The change in plant functional and structural groups and the composition and distribution of the vegetation causes a decrease in production and a decrease in infiltration. Nutrient cycling is restricted as the rooting depth of the vegetation

decreases with the change in functional and structural groups. Plant community diversity is reduced with a loss of native forb diversity and minor grass components. This pathway leads to the Introduced Forbs/Foxtail Barley Plant Community Phase (2.2).

Figure 7. Plant community growth curve (percent production by month). ND5506, Central Black Glaciated Plains, lowland cool-season dominant.. Cool-season dominant, lowland..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	10	37	35	5	2	8	0	0	0

Community 2.2
Introduced Forbs/Foxtail Barley

This phase is a result of heavy to extreme disturbance over time, such as with the abandonment of cropping, or concentration of animals near a watering source. This community phase is highly variable depending on the level and duration of disturbance related to the T2 transitional pathway. In this MLRA, the most probable origin of this phase is secondary succession following cropland abandonment. This plant community will initially include a variety of annual forbs and foxtail barley. Over time, the early seral grass-like species, such as spikerush and rush, will begin to establish on this site.

Pathway 2.1a
Community 2.1 to 2.2

This community pathway is triggered by a change in the natural disturbance regime, most often caused by continuous grazing without adequate recovery periods. Chronic heavy grazing for extended periods during the growing season will also favor this shift. The change in plant functional and structural groups and the composition and distribution of the vegetation causes a decrease in production and a decrease in infiltration. Nutrient cycling is restricted as the rooting depth of the vegetation decreases with the change in functional and structural groups. Plant community diversity is reduced with a loss of native forb diversity and minor grass components. This pathway leads to the Introduced Forbs/Foxtail Barley Plant Community Phase (2.2).

Transition T1a
State 1 to 2

This transition occurs as a result of prolonged periods with a lack of adequate disturbance. Areas protected from grazing and/or fire will begin to build up litter beyond the capability of the site to cycle the organic matter into the soil. This favors the highly competitive strains of reed canarygrass which can increase to complete dominance of the site. This transition leads to a shift across a threshold to the Reed Canarygrass Community Phase (2.1) within the Degraded State (State 2).

Transition T2
State 1 to 2

This transition occurs with cessation of cropping practices being applied to any plant community phase on this ecological site. This transition can also occur with severe prolonged grazing such as areas adjacent to watering sites. This transition leads to the Introduced Forbs/Foxtail Barley Plant Community Phase (2.2) within the Degraded State (State 2).

Transition T2
State 1 to 2

This transition occurs with cessation of cropping practices being applied to any plant community phase on this ecological site. This transition can also occur with severe prolonged grazing such as areas adjacent to watering sites. This transition leads to the Introduced Forbs/Foxtail Barley Plant Community Phase (2.2) within the Degraded State (State 2).

Restoration pathway R2
State 2 to 1

This restoration pathway may be initiated with high levels of prescribed grazing management over a long period of time. The success of this restoration pathway depends on the presence of a remnant population of native grass and grass-like species, or the presence of these species in nearby similar sites. This remnant population may not be readily apparent without close inspection. Wetland restoration techniques may need to be employed to secure this restoration pathway.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Grass-likes**			1625–2600	
	wheat sedge	CAAT2	*Carex atherodes*	650–2600	–
	spikerush	ELEOC	*Eleocharis*	130–650	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	65–520	–
	bottlebrush sedge	CAHY4	*Carex hystericina*	0–325	–
	woolly sedge	CAPE42	*Carex pellita*	0–325	–
	hardstem bulrush	SCAC3	*Schoenoplectus acutus*	0–325	–
	softstem bulrush	SCTA2	*Schoenoplectus tabernaemontani*	0–325	–
	chairmaker's bulrush	SCAM6	*Schoenoplectus americanus*	0–195	–
	mountain rush	JUARL	*Juncus arcticus ssp. littoralis*	0–195	–
	rush	JUNCU	*Juncus*	0–195	–
	Sartwell's sedge	CASA8	*Carex sartwellii*	0–195	–
2	**Grasses**			650–1625	
	American mannagrass	GLGR	*Glyceria grandis*	130–975	–
	fowl mannagrass	GLST	*Glyceria striata*	130–975	–
	common rivergrass	SCFE	*Scolochloa festucacea*	0–650	–
	American sloughgrass	BESY	*Beckmannia syzigachne*	65–650	–
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	0–325	–
	northern reedgrass	CASTI3	*Calamagrostis stricta ssp. inexpansa*	0–195	–
	prairie cordgrass	SPPE	*Spartina pectinata*	0–195	–
	reed canarygrass	PHAR3	*Phalaris arundinacea*	0–195	–
Forb					
3	**Forbs**			975–2275	
	broadfruit bur-reed	SPEU	*Sparganium eurycarpum*	325–1300	–
	Forb, native	2FN	*Forb, native*	65–325	–
	northern water plantain	ALTR7	*Alisma triviale*	65–195	–
	hedgenettle	STACH	*Stachys*	65–195	–
	hemlock waterparsnip	SISU2	*Sium suave*	65–195	–
	Pennsylvania smartweed	POPE2	*Polygonum pensylvanicum*	65–195	–
	broadleaf cattail	TYLA	*Typha latifolia*	0–195	–
	New England aster	SYNO2	*Symphyotrichum novae-angliae*	65–130	–

	cinquefoil	POTEN	*Potentilla*	65–130	–
	Macoun's buttercup	RAMA2	*Ranunculus macounii*	65–130	–
	pale dock	RUAL4	*Rumex altissimus*	65–130	–
	western dock	RUAQ	*Rumex aquaticus*	65–130	–
	marsh skullcap	SCGA	*Scutellaria galericulata*	65–130	–
	giant goldenrod	SOGI	*Solidago gigantea*	0–130	–
	American water horehound	LYAM	*Lycopus americanus*	65–130	–
	swamp smartweed	POHY2	*Polygonum hydropiperoides*	65–130	–
	curlytop knotweed	POLA4	*Polygonum lapathifolium*	65–130	–
	knotweed	POLYG4	*Polygonum*	0–130	–
	rough bugleweed	LYAS	*Lycopus asper*	0–65	–
	Indianhemp	APCA	*Apocynum cannabinum*	0–65	–
	swamp milkweed	ASIN	*Asclepias incarnata*	0–65	–
	smooth horsetail	EQLA	*Equisetum laevigatum*	0–65	–
	white panicle aster	SYLA6	*Symphyotrichum lanceolatum*	0–65	–
	marsh fleabane	SECO2	*Senecio congestus*	0–65	–
	marsh arrowgrass	TRPA28	*Triglochin palustris*	0–65	–

Animal community

Animal Community – Wildlife Interpretations
Major Land Resource Area (MLRA) 55B lies within the Northern mixed-grass prairie ecosystem. Prior to European settlement, this area consisted of diverse grassland habitats interspersed with varying densities of depressional wetlands and limited woody riparian corridors. These habitats provided critical life cycle components for many of its users. Many species of grassland birds and herds of roaming bison, elk, and pronghorn were among the inhabitants. These species, as well as several small mammal and insect species, were the primary consumers linking the grassland resources to predators such as wolves, mountain lions, and grizzly bears as well as smaller carnivores such as coyotes, bobcats, foxes and raptors. In addition, a wide variety of small mammals, reptiles, amphibians and insects were adapted to this semi-arid climate.

Historically, the Northern mixed-grass prairie was a disturbance-driven ecosystem with fire, herbivory and climate functioning as the primary disturbance factors either singly or in combination. Following European settlement, widespread conversion to cropland, elimination of fire, and habitat fragmentation influenced species composition and abundance. Introduced and invasive species further impacted plant and animal communities. Bison were historically a keystone species but have been extirpated as a free-ranging herbivore. The loss of bison and fire as ecological drivers greatly influenced the character of the remaining native plant community and the habitats that they provide. Fragmentation has reduced habitat quality for area-sensitive species.

Animal Community – Grazing Interpretations
This site is well adapted to managed grazing by domestic livestock. The predominance of herbaceous plants across all plant community phases best lends these sites to grazing by cattle but other domestic grazers with differing diet preferences may also be a consideration depending upon management objectives. Often, the current plant community does not entirely match any particular plant community (as described in the ecological site description). Because of this, a resource inventory is necessary to document plant composition and production. Proper interpretation of this inventory data will permit the establishment of a safe, initial stocking rate for the type and class of animals and level of grazing management. More accurate stocking rate estimates should eventually be calculated using actual stocking rate information and monitoring data.

Hydrological functions

Water is the principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic groups C and D. Infiltration is very slow and runoff is negligible due to the concave nature of the landscape on

which this site occurs.

Recreational uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

Wood products

No appreciable wood products are present on the site.

Other products

Seed harvest of native plant species can provide additional income on this site.

Inventory data references

Information presented here has been derived from NRCS and other federal/state agency clipping and inventory data. Also, field knowledge of range-trained personnel was used. All descriptions were peer reviewed and/or field-tested by various private, state and federal agency specialists. Those involved in developing this site description include: Stan Boltz, NRCS Range Management Specialist; David Dewald, NRCS State Biologist; Jody Forman, NRCS Range Management Specialist; Jeff Printz, NRCS State Range Management Specialist; Kevin Sedivec, Extension Rangeland Management Specialist; Shawn Dekeyser, North Dakota State University; Rob Self, The Nature Conservancy and Lee Voigt, NRCS Range Management Specialist.

There are 43 SCS-Range-417's collected from 1969 to 1976 in Stutsman County, ND.

Other references

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (http://hpccsun.unl.edu)
USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (http://wcc.nrcs.usda.gov)
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USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
USDA, NRCS, Various Published Soil Surveys.

Contributors

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

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Date	04/19/2012
Approved by	Jeff Printz
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None.

2. **Presence of water flow patterns:** None.

3. **Number and height of erosional pedestals or terracettes:** None.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is 0 to 5%. Amount of bare ground may increase for a short time following periods of inundation.

5. **Number of gullies and erosion associated with gullies:** None.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None.

7. **Amount of litter movement (describe size and distance expected to travel):** None.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil surface fragments will typically retain structure indefinitely when dipped in distilled water.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Use soil series description for depth, color and structure of A horizon/surface layer. Stability class of 6.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Combination of shallow and deep rooted species (mid & tall rhizomatous and tufted perennial cool- and warm-season grasses) with fine and coarse roots positively influences infiltration.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None.

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant: Grass-likes > forbs >

    Sub-dominant: Tall, cool-season rhizomatous grasses >

    Other: Mid, cool-season annual grass > tall, warm-season rhizomatous grasses = mid cool-season rhizomatous grasses

    Additional: Due to differing root structure and distribution, Kentucky bluegrass and smooth bromegrass do not fit into reference plant community F/S groups.

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** None.

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14. **Average percent litter cover (%) and depth (in):** Plant litter is in contact with soil surface.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Representative value = 6500 lbs/ac air dry with a range of 5500 to 7500 lbs./acre air dry depending upon growing conditions.

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** State and local noxious, Kentucky bluegrass, smooth bromegrass, reed canarygrass, redtop

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17. **Perennial plant reproductive capability:** All species exhibit high vigor relative to climatic conditions. Do not rate based solely on seed production. Perennial grasses should have vigorous rhizomes or tillers.
