USDA Natural Resources
Conservation Service

Ecological site R053BY005ND
Loamy Overflow

Last updated: 1/11/2024
Accessed: 05/13/2025

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.

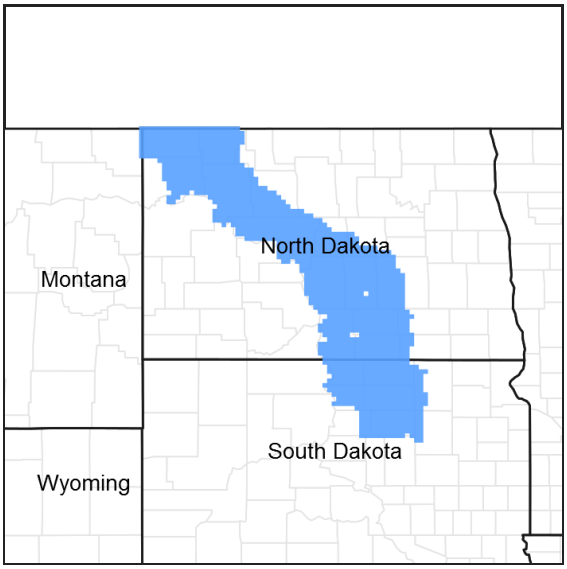


Figure 1. Mapped extent

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

R053BY001ND	**Clayey**
R053BY004ND	**Limy Subirrigated**
R053BY008ND	**Sandy**
R053BY011ND	**Loamy**
R053BY012ND	**Subirrigated**
R053BY019ND	**Wet Meadow**

Similar sites

R053BY012ND	**Subirrigated** [Some what poorly drained soils with no evidence of lime or salts. Water table found at a depth of1.5 to 4' from the soil surface at some point during the growing season. Found upslope from Wet Meadow sites and downslope of Loamy Overflow sites; can be in micro low or high positions within the listed associated sites. Indicator species are big bluestem intermixed with switchgrass and American licorice with shrubs like western snowberry. The site has more switchgrass, prairie cordgrass, less green needlegrass; higher production]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Andropogon gerardii*

Physiographic features

This site occurs on areas that receive additional water from overflow of intermittent streams or runoff from adjacent slopes.

Table 2. Representative physiographic features

Landforms	(1) Till plain (2) Swale (3) Flood plain
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to frequent
Ponding frequency	None
Elevation	488–610 m
Slope	0–3%
Water table depth	91–203 cm
Aspect	Aspect is not a significant factor

Climatic features

MLRA 53B 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 15 to 20 inches per year. The normal average annual temperature is about 41° F. January is the coldest month with average temperatures ranging from about 4° F (Powers Lake, ND) to about 10° F (Pollock, SD). July is the warmest month with temperatures averaging from about 67° F (Powers Lake, ND) to about 72° F (Pollock, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 62° 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)	135 days

Freeze-free period (average)	156 days
Precipitation total (average)	508 mm

Influencing water features

Stream Type: C6
(Rosgen System)

Soil features

These are deep and very deep, moderately well and well drained, moderately coarse to fine textured soils. Saturated hydraulic conductivity is moderate to slow and available water capacity is moderate to high. Salinity is none to very slight and sodicity is none. This site is in swale positions that regularly receive additional run-on from surrounding uplands or flooding. These soils occur on swales, terraces and footslopes on lake plains, residual uplands, till plains, and frequently flooded stream terraces and flood plains. Slope ranges from 0 to 3 percent. This site should show slight to no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are broken, irregular in appearance or discontinuous. The soil surface is stable and intact.
These soils are mainly susceptible to water erosion. The hazard of water erosion increases where vegetative cover is not adequate. Loss of the soil surface layer can result in a shift in species composition and/or production.

Major soil series correlated to this ecological site can be found in Section II of the Natural Resources Conservation Service Field Office Technical Guide or the following web sites:
http://www.nrcs.usda.gov/technical/efotg/

Table 4. Representative soil features

Surface texture	(1) Loam (2) Silt loam (3) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Slow to moderately rapid
Soil depth	203 cm
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	15.24–20.32 cm
Calcium carbonate equivalent (0-101.6cm)	0–20%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–2
Soil reaction (1:1 water) (0-101.6cm)	6.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–30%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

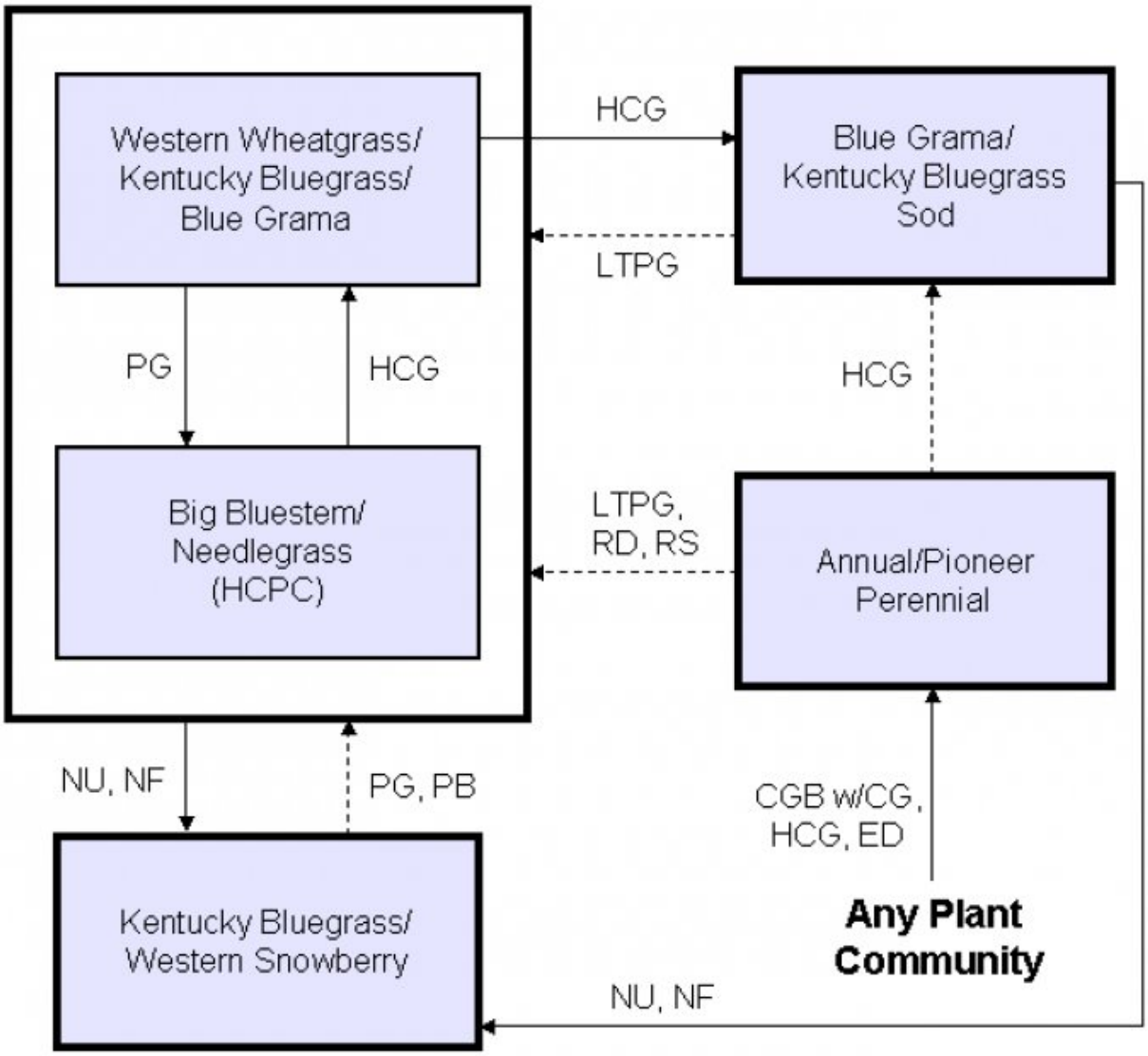
The site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to climatic conditions and/or management actions. Due to the nature of the soils, the site is considered very stable. Under continued adverse impacts, a slow decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can quickly return to the Historic Climax Plant Community (HCPC).

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community. The HCPC 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. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.
Continuous grazing without adequate recovery periods following each grazing occurrence over several years causes this site to depart from the HCPC. Species such as western wheatgrass and blue grama will initially increase. Big bluestem, green needlegrass, and sideoats grama will decrease in frequency and production. In time, heavy continuous grazing will likely cause blue grama to dominate the site and then this plant community is relatively stable and the competitive advantage prevents other species from establishing. This plant community is less productive than the HCPC. Runoff increases and infiltration will decrease. Soil erosion will be minimal.

Extended periods of non-use and/or lack of fire will result in a plant community having high litter levels, which favors an increase in Kentucky bluegrass and/or smooth bromegrass. In time, shrubs such as western snowberry and chokecherry will likely increase and then dominate the site.

The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

State and transition model



CGB w/CG – Cropped go-back with continuous grazing; **ED** – Excessive defoliation; **HCG** – Heavy continuous grazing; **HCPC** – Historic Climax Plant Community; **LTPG** – Long-term prescribed grazing; **NU, NF** – Non-use, no fire; **PB** – Prescribed burning followed by prescribed grazing; **PG** – Prescribed grazing with adequate recovery opportunity; **RS** – Range seeding followed by prescribed grazing; **RD** – Removal of disturbance.

State 1
Big Bluestem/Needlegrass (HCPC)

Community 1.1
Big Bluestem/Needlegrass (HCPC)

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This community evolved with grazing by large herbivores and occasional prairie fire. It is well suited for grazing by domestic livestock and can be found on areas that are properly managed with prescribed grazing that allows for adequate recovery periods following each grazing event. The potential vegetation is about 78% grasses and grass-like plants, 10% forbs, 10% shrubs, and 2% trees. Major grasses include big bluestem, green needlegrass, switchgrass and western wheatgrass. Other grasses occurring on this community include blue grama, Canada wildrye, and porcupine grass. Major forbs and shrubs include American vetch, purple prairie clover, and western snowberry. Scattered green ash and American elm may occur. This plant community is well adapted to the Northern Great Plains climatic conditions. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). Community dynamics, nutrient cycle, water cycle and energy flow are functioning properly. Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low. The diversity in plant species allows for high drought tolerance. Run-off from adjacent sites and moderate or high available water capacity provides a favorable soil-water-plant relationship.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2724	3276	3895
Shrub/Vine	191	294	420
Forb	191	294	420
Tree	34	59	84
Total	**3140**	**3923**	**4819**

Figure 5. Plant community growth curve (percent production by month). ND5304, Missouri Coteau, warm-season dominant, cool-season sub-dominant.. Warm-season dominant, cool-season sub-dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	1	5	20	38	25	8	3	0	0	0

State 2
Western Wheatgrass/Kentucky Bluegrass/Blue Grama

Community 2.1
Western Wheatgrass/Kentucky Bluegrass/Blue Grama

This plant community results from continuous grazing without adequate recovery periods between each grazing event during the growing season. Recognition of this plant community will enable the land user to implement key management decisions before a significant ecological threshold is crossed. Western wheatgrass, Kentucky bluegrass and blue grama are the dominant species. Big bluestem and green needlegrass are greatly reduced. Sideoats grama has been removed. Forb species include western yarrow, asters, prairie coneflower, silverleaf scurfpea and western ragweed. Shrub species would tend to be heavily browsed or damaged due to trampling. This plant community is relatively stable and less productive than the HCPC. Reduction of litter and reduced plant vigor result in higher soil temperatures, poor water infiltration rates, increased runoff and high evapo-transpiration rates. This plant community can occur throughout the site, on spot grazed areas, and around water sources where season-long grazing patterns occur. Soil erosion will be minimal due to the sod forming habit of Kentucky bluegrass and blue grama.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1861	2423	2959
Forb	135	280	448
Shrub/Vine	22	84	146
Tree	–	15	34
Total	**2018**	**2802**	**3587**

Figure 7. Plant community growth curve (percent production by month). ND5302, Missouri Coteau, cool-season dominant, warm-season sub-dominant.. Cool-season dominant, warm-season sub-dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	7	23	42	15	5	4	1	0	0

State 3
Blue Grama/Kentucky Bluegrass Sod

Community 3.1
Blue Grama/Kentucky Bluegrass Sod

This plant community developed with heavy continuous grazing without adequate recovery periods between grazing events. Blue grama and Kentucky bluegrass dominate the community and can develop into a “sodbound” appearance. Low vigor western wheatgrass can be found scattered throughout the community. Green needlegrass has been removed. Big bluestem may persist in minor amounts, greatly reduced in vigor and not readily seen. Rose pussytoes, western yarrow, silverleaf scurfpea, curlycup gumweed and goldenrod have increased and/or invaded. Key shrubs have been severely reduced in vigor or removed completely. This plant community is resistant to change due to grazing tolerance of Kentucky bluegrass and blue grama. A significant amount of production and diversity has been lost when compared to the HCPC. Loss of cool season grasses, tall warm season grasses, shrub component and nitrogen fixing forbs have negatively impacted energy flow and nutrient cycling. Water infiltration is reduced significantly due to the massive shallow root system (root pan), characteristic of "sodbound" blue grama and/or Kentucky bluegrass. Soil loss may be accelerated where concentrated flows occur. It will take a very long time to restore this plant community back to the HCPC with improved management. Renovation would be very costly.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1233	1745	2225
Forb	95	202	336
Shrub/Vine	17	61	106
Tree	–	10	22
Total	**1345**	**2018**	**2689**

Figure 9. Plant community growth curve (percent production by month). ND5303, Missouri Coteau, cool-season/warm-season co-dominant.. Cool-season, warm-season co-dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	2	6	21	40	20	6	4	1	0	0

State 4
Kentucky Bluegrass/Western Snowberry

Community 4.1
Kentucky Bluegrass/Western Snowberry

This plant community develops after an extended period (10 to 20 years or more) of non-use and exclusion of fire. Eventually litter levels become high enough to reduce native grass vigor, diversity and density. Kentucky bluegrass and/or smooth bromegrass dominate this plant community. Common forbs include American licorice, cudweed sagewort, and silverleaf scurfpea. Shrubs such as western snowberry and chokecherry will increase in density and cover. This plant community is resistant to change without prescribed grazing and/or fire. The combination of both grazing and fire is most effective in moving this plant community toward the HCPC. Soil erosion is low. Runoff is similar to the HCPC. Once the advanced stage of this plant community is reached, time and external resources will be needed to see recovery in the diversity of the site.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2068	2322	2567
Shrub/Vine	247	471	673
Forb	151	314	504
Tree	–	31	67
Total	**2466**	**3138**	**3811**

Figure 11. Plant community growth curve (percent production by month). ND5301, Missouri Coteau, cool-season dominant.. Cool-season dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	8	24	45	10	3	5	2	0	0

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Tall Warm-Season**			981–1373	
	big bluestem	ANGE	*Andropogon gerardii*	785–1177	–
	switchgrass	PAVI2	*Panicum virgatum*	196–392	–
	Indiangrass	SONU2	*Sorghastrum nutans*	39–78	–
2	**Needlegrass**			392–588	
	porcupinegrass	HESP11	*Hesperostipa spartea*	78–392	–
	green needlegrass	NAVI4	*Nassella viridula*	78–392	–
3	**Wheatgrass**			314–471	
	western wheatgrass	PASM	*Pascopyrum smithii*	196–392	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	39–78	–
	slender wheatgrass	ELTRS	*Elymus trachycaulus ssp. subsecundus*	39–78	–
4	**Mid Warm-Season**			78–196	
	sideoats grama	BOCU	*Bouteloua curtipendula*	39–196	–
	little bluestem	SCSC	*Schizachyrium scoparium*	39–196	–
5	**Other Native Grasses**			78–235	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	39–157	–
	Grass, perennial	2GP	*Grass, perennial*	39–118	–

	blue grama	BOGR2	*Bouteloua gracilis*	39–78	–
	Canada wildrye	ELCA4	*Elymus canadensis*	39–78	–
	marsh muhly	MURA	*Muhlenbergia racemosa*	39–78	–
	dropseed	SPORO	*Sporobolus*	39–78	–
6	**Grass-Likes**			78–196	
	Pennsylvania sedge	CAPE6	*Carex pensylvanica*	78–196	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	39–118	–
	shortbeak sedge	CABR10	*Carex brevior*	39–78	–
Forb					
8	**Forbs**			196–392	
	white sagebrush	ARLU	*Artemisia ludoviciana*	39–118	–
	downy gentian	GEPU5	*Gentiana puberulenta*	39–118	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	39–78	–
	Maximilian sunflower	HEMA2	*Helianthus maximiliani*	39–78	–
	Forb, perennial	2FP	*Forb, perennial*	0–78	–
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	39–78	–
	goldenrod	SOLID	*Solidago*	39–78	–
	white heath aster	SYER	*Symphyotrichum ericoides*	39–78	–
	American vetch	VIAM	*Vicia americana*	39–78	–
	purple prairie clover	DAPU5	*Dalea purpurea*	39–78	–
	streamside fleabane	ERGLP	*Erigeron glabellus var. pubescens*	39–78	–
	Indianhemp	APCA	*Apocynum cannabinum*	39–78	–
	northern bedstraw	GABO2	*Galium boreale*	0–39	–
	meadow zizia	ZIAP	*Zizia aptera*	0–39	–
	Canadian anemone	ANCA8	*Anemone canadensis*	0–39	–
	Flodman's thistle	CIFL	*Cirsium flodmanii*	0–39	–
	silverleaf Indian breadroot	PEAR6	*Pediomelum argophyllum*	0–39	–
Shrub/Vine					
9	**Shrubs**			196–392	
	western snowberry	SYOC	*Symphoricarpos occidentalis*	78–196	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–118	–
	Saskatoon serviceberry	AMAL2	*Amelanchier alnifolia*	39–78	–
	leadplant	AMCA6	*Amorpha canescens*	0–78	–
	hawthorn	CRATA	*Crataegus*	39–78	–
	American plum	PRAM	*Prunus americana*	39–78	–
	chokecherry	PRVI	*Prunus virginiana*	39–78	–
	golden currant	RIAU	*Ribes aureum*	39–78	–
	prairie rose	ROAR3	*Rosa arkansana*	39–78	–
Tree					
10	**Trees**			39–78	
	Tree	2TREE	*Tree*	0–78	–
	green ash	FRPE	*Fraxinus pennsylvanica*	39–78	

	green ash	FRPE	*Fraxinus pennsylvanica*	39–78	–
	American elm	ULAM	*Ulmus americana*	0–39	–
	boxelder	ACNE2	*Acer negundo*	0–39	–
	common hackberry	CEOC	*Celtis occidentalis*	0–39	–

Table 10. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Tall Warm-Season**			56–140	
	big bluestem	ANGE	*Andropogon gerardii*	56–140	–
	switchgrass	PAVI2	*Panicum virgatum*	0–28	–
2	**Needlegrass**			28–84	
	green needlegrass	NAVI4	*Nassella viridula*	28–84	–
	porcupinegrass	HESP11	*Hesperostipa spartea*	0–28	–
3	**Wheatgrass**			140–560	
	western wheatgrass	PASM	*Pascopyrum smithii*	140–560	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	0–280	–
	slender wheatgrass	ELTRS	*Elymus trachycaulus ssp. subsecundus*	0–280	–
4	**Mid Warm-Season**			0–56	
	sideoats grama	BOCU	*Bouteloua curtipendula*	0–56	–
	little bluestem	SCSC	*Schizachyrium scoparium*	0–28	–
5	**Other Native Grasses**			280–701	
	blue grama	BOGR2	*Bouteloua gracilis*	140–560	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	28–280	–
	dropseed	SPORO	*Sporobolus*	0–140	–
	Grass, perennial	2GP	*Grass, perennial*	0–140	–
	marsh muhly	MURA	*Muhlenbergia racemosa*	0–28	–
	Canada wildrye	ELCA4	*Elymus canadensis*	0–28	–
6	**Grass-Likes**			28–112	
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–84	–
	Pennsylvania sedge	CAPE6	*Carex pensylvanica*	28–84	–
	shortbeak sedge	CABR10	*Carex brevior*	0–56	–
7	**Non-Native Grasses**			140–560	
	Kentucky bluegrass	POPR	*Poa pratensis*	140–560	–
	smooth brome	BRIN2	*Bromus inermis*	56–420	–
	cheatgrass	BRTE	*Bromus tectorum*	28–280	–
Forb					
8	**Forbs**			140–420	
	Forb, annual	2FA	*Forb, annual*	0–140	–
	Forb, perennial	2FP	*Forb, perennial*	0–140	–
	Canada thistle	CIAR4	*Cirsium arvense*	0–140	–
	sweetclover	MELIL	*Melilotus*	0–140	–
	white heath aster	SYER	*Symphyotrichum ericoides*	28–140	–

	white heath aster	SYER	*Symphyotrichum ericoides*	28–140	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	28–112	–
	common dandelion	TAOF	*Taraxacum officinale*	28–84	–
	yellow salsify	TRDU	*Tragopogon dubius*	0–84	–
	silverleaf Indian breadroot	PEAR6	*Pediomelum argophyllum*	0–84	–
	goldenrod	SOLID	*Solidago*	28–84	–
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	28–84	–
	Indianhemp	APCA	*Apocynum cannabinum*	28–84	–
	Flodman's thistle	CIFL	*Cirsium flodmanii*	0–56	–
	purple prairie clover	DAPU5	*Dalea purpurea*	28–56	–
	northern bedstraw	GABO2	*Galium boreale*	0–56	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–56	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–56	–
	cocklebur	XANTH2	*Xanthium*	0–56	–
	American vetch	VIAM	*Vicia americana*	0–28	–
	streamside fleabane	ERGLP	*Erigeron glabellus var. pubescens*	0–28	–
Shrub/Vine					
9	**Shrubs**			28–140	
	prairie rose	ROAR3	*Rosa arkansana*	28–112	–
	western snowberry	SYOC	*Symphoricarpos occidentalis*	28–112	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–84	–
	American plum	PRAM	*Prunus americana*	28–56	–
	chokecherry	PRVI	*Prunus virginiana*	0–28	–
	Saskatoon serviceberry	AMAL2	*Amelanchier alnifolia*	0–28	–
	hawthorn	CRATA	*Crataegus*	0–28	–
Tree					
10	**Trees**			0–28	
	Tree	2TREE	*Tree*	0–28	–
	boxelder	ACNE2	*Acer negundo*	0–28	–
	common hackberry	CEOC	*Celtis occidentalis*	0–28	–
	green ash	FRPE	*Fraxinus pennsylvanica*	0–28	–
	American elm	ULAM	*Ulmus americana*	0–28	–

Table 11. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Tall Warm-Season**			0–40	
	big bluestem	ANGE	*Andropogon gerardii*	0–40	–
2	**Needlegrass**			0–40	
	green needlegrass	NAVI4	*Nassella viridula*	0–40	–
3	**Wheatgrass**			101–303	
	western wheatgrass	PASM	*Pascopyrum smithii*	40–303	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	0–202	–

	slender wheatgrass	ELTRS	*Elymus trachycaulus ssp. subsecundus*	0–202	–
4	**Mid Warm-Season**			0–40	
	sideoats grama	BOCU	*Bouteloua curtipendula*	0–40	–
5	**Other Native Grasses**			303–605	
	blue grama	BOGR2	*Bouteloua gracilis*	303–605	–
	dropseed	SPORO	*Sporobolus*	0–101	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	0–61	–
	Grass, perennial	2GP	*Grass, perennial*	0–61	–
6	**Grass-Likes**			20–61	
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–61	–
	Pennsylvania sedge	CAPE6	*Carex pensylvanica*	20–61	–
	shortbeak sedge	CABR10	*Carex brevior*	0–20	–
7	**Non-Native Grasses**			202–504	
	Kentucky bluegrass	POPR	*Poa pratensis*	101–504	–
	smooth brome	BRIN2	*Bromus inermis*	40–303	–
	cheatgrass	BRTE	*Bromus tectorum*	0–101	–
Forb					
8	**Forbs**			101–303	
	Canada thistle	CIAR4	*Cirsium arvense*	0–161	–
	cocklebur	XANTH2	*Xanthium*	0–161	–
	Forb, annual	2FA	*Forb, annual*	0–101	–
	Forb, perennial	2FP	*Forb, perennial*	0–101	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	20–101	–
	sweetclover	MELIL	*Melilotus*	0–101	–
	white heath aster	SYER	*Symphyotrichum ericoides*	20–101	–
	common dandelion	TAOF	*Taraxacum officinale*	20–101	–
	yellow salsify	TRDU	*Tragopogon dubius*	0–61	–
	silverleaf Indian breadroot	PEAR6	*Pediomelum argophyllum*	0–61	–
	goldenrod	SOLID	*Solidago*	20–61	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–61	–
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	20–61	–
	Indianhemp	APCA	*Apocynum cannabinum*	20–61	–
	Flodman's thistle	CIFL	*Cirsium flodmanii*	0–61	–
	purple prairie clover	DAPU5	*Dalea purpurea*	20–40	–
	northern bedstraw	GABO2	*Galium boreale*	0–20	–
Shrub/Vine					
9	**Shrubs**			20–101	
	prairie rose	ROAR3	*Rosa arkansana*	20–101	–
	western snowberry	SYOC	*Symphoricarpos occidentalis*	20–61	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–61	–
	American plum	PRAM	*Prunus americana*	0–40	–

	hawthorn	CRATA	*Crataegus*	0–20	–
Tree					
10	**Trees**			0–20	
	Tree	2TREE	*Tree*	0–20	–
	boxelder	ACNE2	*Acer negundo*	0–20	–
	common hackberry	CEOC	*Celtis occidentalis*	0–20	–
	green ash	FRPE	*Fraxinus pennsylvanica*	0–20	–
	American elm	ULAM	*Ulmus americana*	0–20	–

Table 12. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Tall Warm-Season**			0–157	
	big bluestem	ANGE	*Andropogon gerardii*	0–157	–
	switchgrass	PAVI2	*Panicum virgatum*	0–31	–
2	**Needlegrass**			31–157	
	green needlegrass	NAVI4	*Nassella viridula*	31–157	–
	porcupinegrass	HESP11	*Hesperostipa spartea*	0–94	–
3	**Wheatgrass**			63–314	
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	0–314	–
	slender wheatgrass	ELTRS	*Elymus trachycaulus ssp. subsecundus*	0–314	–
	western wheatgrass	PASM	*Pascopyrum smithii*	31–157	–
5	**Other Native Grasses**			31–157	
	Grass, perennial	2GP	*Grass, perennial*	0–157	–
	blue grama	BOGR2	*Bouteloua gracilis*	0–157	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	0–157	–
	dropseed	SPORO	*Sporobolus*	0–157	–
	marsh muhly	MURA	*Muhlenbergia racemosa*	0–94	–
	Canada wildrye	ELCA4	*Elymus canadensis*	0–94	–
6	**Grass-Likes**			31–94	
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–94	–
	shortbeak sedge	CABR10	*Carex brevior*	0–94	–
	Pennsylvania sedge	CAPE6	*Carex pensylvanica*	31–94	–
7	**Non-Native Grasses**			471–1098	
	Kentucky bluegrass	POPR	*Poa pratensis*	157–1098	–
	smooth brome	BRIN2	*Bromus inermis*	63–628	–
	cheatgrass	BRTE	*Bromus tectorum*	0–251	–
Forb					
8	**Forbs**			157–471	
	sweetclover	MELIL	*Melilotus*	0–314	–
	Forb, annual	2FA	*Forb, annual*	0–157	–
	Forb, perennial	2FP	*Forb, perennial*	0–157	–

	Canada thistle	CIAR4	*Cirsium arvense*	0–157	–
	common dandelion	TAOF	*Taraxacum officinale*	31–157	–
	yellow salsify	TRDU	*Tragopogon dubius*	31–157	–
	goldenrod	SOLID	*Solidago*	31–126	–
	Indianhemp	APCA	*Apocynum cannabinum*	31–126	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	31–126	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–94	–
	cocklebur	XANTH2	*Xanthium*	0–94	–
	white heath aster	SYER	*Symphyotrichum ericoides*	31–63	–
	silverleaf Indian breadroot	PEAR6	*Pediomelum argophyllum*	31–63	–
	Flodman's thistle	CIFL	*Cirsium flodmanii*	0–63	–
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	0–63	–
	Maximilian sunflower	HEMA2	*Helianthus maximiliani*	0–63	–
	Canadian anemone	ANCA8	*Anemone canadensis*	0–31	–
	purple prairie clover	DAPU5	*Dalea purpurea*	0–31	–
	northern bedstraw	GABO2	*Galium boreale*	0–31	–
	downy gentian	GEPU5	*Gentiana puberulenta*	0–31	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–31	–
	meadow zizia	ZIAP	*Zizia aptera*	0–31	–
Shrub/Vine					
9	**Shrubs**			314–628	
	western snowberry	SYOC	*Symphoricarpos occidentalis*	63–628	–
	American plum	PRAM	*Prunus americana*	0–314	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–157	–
	prairie rose	ROAR3	*Rosa arkansana*	31–157	–
	chokecherry	PRVI	*Prunus virginiana*	0–94	–
	hawthorn	CRATA	*Crataegus*	0–94	–
	golden currant	RIAU	*Ribes aureum*	0–63	–
	Saskatoon serviceberry	AMAL2	*Amelanchier alnifolia*	0–63	–
	leadplant	AMCA6	*Amorpha canescens*	0–31	–
Tree					
10	**Trees**			0–63	
	Tree	2TREE	*Tree*	0–63	–
	boxelder	ACNE2	*Acer negundo*	0–63	–
	common hackberry	CEOC	*Celtis occidentalis*	0–63	–
	green ash	FRPE	*Fraxinus pennsylvanica*	0–63	–
	American elm	ULAM	*Ulmus americana*	0–63	–

Animal community

Wildlife Interpretations:
Under development.

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 group B, with localized areas in hydrologic group C. Infiltration and runoff potential for this site varies from negligible to moderate depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where shortgrasses form a dense sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

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 clipping and other 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; Michael D. Brand, State Land Dept., Director Surface Management; David Dewald, NRCS State Biologist; Paul Drayton, NRCS District Conservationist; Jody Forman, NRCS Range Management Specialist; Dennis Froemke, NRCS Range Management Specialist; Jeff Printz, NRCS State Range Management Specialist; Josh Saunders, NRCS Range Management Specialist; Kevin Sedivec, Extension Rangeland Management Specialist; Darrell Vanderbusch, NRCS Resource Soil Scientist; and Lee Voigt, NRCS Range Management Specialist.

Other references

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Contributors

Jeff Printz
Jeff Printz/Stan Boltz

Approval

Suzanne Mayne-Kinney, 1/11/2024

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.

Author(s)/participant(s)	Jeff Printz, Stan Boltz, Lee Voigt, Jody Forman
Contact for lead author	Jeff.printz@nd.usda.gov 701-530-2080
Date	01/17/2012
Approved by	Suzanne Mayne-Kinney
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):** Less than 5%.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** None. Limited deposition may be visible following major rainfall events.

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 aggregate stability ratings should typically be 5 to 6, normally 6. Soil surface fragments will typically retain structure indefinitely when dipped in distilled water.

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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.

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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.

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

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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: Tall, warm-season rhizomatous grasses > >

    Sub-dominant: Mid, cool-season bunchgrasses > mid, cool-season rhizomatous grasses >

    Other: Forbs = shrubs > grass-likes = mid warm-season grasses > trees > short warm-season 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):** 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 = 3500 lbs/ac air dry with a range of 2800 to 4300 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 weeds, Kentucky bluegrass, smooth bromegrass, Russian olive, Siberian elm

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